AIMB-740-6CB1

Socket 478 Intel® Pentium® 4/ Celeron-D Industrial ATX Motherboard with 6 Serial Ports

User's Manual

Copyright Notice

This document is copyrighted, 2006, by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements to the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements upon the rights of third parties which may result from its use.

Acknowledgements

- AWARD is a trademark of Phoenix Technologies Ltd.
- IBM and PC are trademarks of International Business Machines Corporation.
- Intel®, Pentium® 4, and Celeron® are trademarks of Intel Corporation.
- WinBond is a trademark of Winbond Corporation.

All other product names or trademarks are the properties of their respective owners.

Part No. 2002C74000 1st. Edition

Printed in Taiwan February 2006

1.0.1 A Message to the Customer

Advantech customer services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known.

Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

***FCC**:*

This device complies with the requirements in part 15 of the FCC rule. Operation is subject to the following two conditions:

1. *This device may not cause harmful interference, and*
2. *This device must accept any interference received, including interference that may cause undesired operation.*

***CAUTION!!** Danger of explosion if battery is incorrectly replaced. The battery does not need to be charged. Replace only with Advantech-specified batteries.*

Table 1.1: AIMB-740-6CB1

Model	AIMB-740VE-6CB1
CPU: Single socket 478 Intel® Pentium® 4/ Celeron-D/ Mobile Pentium® 4-M	Yes
Chipset	845GV
DDR SDRAM ECC support	No
Memory	DDR200/266/333
AGP 4X slot	No
VGA: Chipset integrated VGA	Yes
LAN 1: 10/100Base-T, Intel 82562	Yes
LAN 2: 10/100Base-TIntel 82551	No
LAN 1: 10/100/1000Base-T Intel 82541	No

Table 1.2: AIMB-740-6CB1 DDR memory compatibility table

Brand	Size	Speed	Type	ECC	Part #	Memory
Apacer	256MB	DDR266	DDR	N	77.10603.112	INFINEON HYB25D25680BT-7 (32×8)
Kingston	512MB	DDR266	DDR	N	KVR266X64C2 5/512	KINGSTON D328DL-60 (32×8)
Apacer	512MB	DDR333	DDR	N	77.10728.56G	MOSEL V58C2256804SAT5B
DSL	256MB	DDR333	DDR	N	N/A	SAMSUNG K4H560838F-TCB3(32×8)
DSL	512MB	DDR333	DDR	N	N/A	SAMSUNG K4H560838F-TCB3
DSL	1GB	DDR333	DDR	N	N/A	SAMSUNG K4H510838B-TCB3
UG	512MB	DDR333	DDR	N	UG764D6688K N-DH	ELPIDA DD2508AMTA
UG	1GB	DDR333	DDR	N	UG7128D6688 LP-DH	SAMSUNG K4H510838B-TCB3
UG	1GB	DDR333	DDR	N	UG7128D6688 LP-DH	ELPIDA DD5108ADTA-6B
Apacer	256MB	DDR400	DDR	N	77.10636.115	INFINEON HYB25D256800BT-5
Apacer	256MB	DDR400	DDR	N	77.10636.465	SAMSUNG K4H560838E-TCCC
Apacer	512MB	DDR400	DDR	N	77.10736.464	SAMSUNG K4H560838E-TCCC
Apacer	1GB	DDR400	DDR	N	77.11136.464	SAMSUNG K4H510838B-TCCC
Transcend	256MB	DDR400	DDR	N	TS32MLD64V 4F3	MOSEL V58C2256804SAT5 (32×8)
Transcend	512MB	DDR400	DDR	N	TS64MLD64V 4F3	SAMSUNG K4H560838F-TCCC (32×8)
Transcend	1GB	DDR400	DDR	N	TS128MLD64 V4J	SAMSUNG K4H510838B-TCCC
DSL	512MB	DDR400	DDR	N	N/A	SAMSUNG K4H560838F-TCCC (32×8)
DSL	256MB	DDR400	DDR	N	N/A	HYNIX HY5DU56822BT-D43
UG	512MB	DDR400	DDR	N	UG764D6688K P-GJ	ELPIDA DD2508AMTA
UG	1GB	DDR400	DDR	N	UG7128D6688 LP-GJ	SAMSUNG K4H510838B-TCCC

1.0.2 Product warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, type of PC, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

1.0.3 Initial Inspection

Before you begin installing your motherboard, please make sure that the following materials have been shipped:

- AIMB-740-6CB1 Pentium® 4/Celeron-D/Mobile Pentium 4-M processor-based industrial motherboard
- 1 FDD cable P/N: 1700340640
- 1 Startup Manual
- 1 CD with driver and manual
- 2 Ultra ATA 100 HDD cables P/N: 1701400452
- 1 Single COM port cable kit P/N: 1701090401
- 2 Dual COM ports cable kit P/N: 1701092300
- I/O port bracket P/N: 1960004027
- Warranty certificate P/N: 2190000902
- EMI sponge P/N: 2130000037

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-740-6CB1 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt.

As you unpack the AIMB-740-6CB1, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

1.0.4 Release Note

Date	Revision	Change
February 2006	1st. Ed	Initial Release

Contents

Chapter 1 Hardware Configuration 2

1.1 Introduction 2
1.2 Features 3
1.3 Specifications 3
1.4 Jumpers and Connectors 5
Table 1.1: Jumpers 5
Table 1.2: Connectors 6
1.5 Board Layout: Jumper and Connector Locations 8
Figure 1.1: AIMB-740-6CB1 Jumpers and Connectors 8
Figure 1.2: I/O Connectors 8
1.6 AIMB-740-6CB1 Block Diagram 9
Figure 1.3: AIMB-740-6CB1 Block Diagram 9
1.7 Safety Precautions 10
1.8 Jumper Settings 11
Table 1.3: CMOS (J1) 11
Table 1.4: Watchdog timer output (J2) 12
1.9 System Memory 14
Table 1.5: DIMM module allocation table 14
Table 1.6: DIMM mem capacity sample calculation . 14
1.10 Memory Installation Procedures 14
1.11 Cache Memory 15
1.12 Processor Installation 15
1.13 PCI Bus Routing Table 16
Table 1.7: PCIBus Routing Table: 16
Table 1.8: 1U PCI Riser Card Bus Routing Table 16
Table 1.9: 2U PCI Riser Card Bus Routing Table 16

Chapter 2 Connecting Peripherals 18

2.1 Introduction 18
2.2 Primary and Secondary IDE connectors (CN1/2) 18
2.3 Floppy Drive connector (CN3) 19
2.4 Parallel Port (CN4) 20
2.5 USB Ports (CN6) 20
2.6 VGA connector (CN7) 21
2.7 Serial Ports (COM1: CN9, COM2: CN10, COM3: CN23, COM4: CN26, COM5: CN67, COM6: CN70) ... 21
2.8 PS/2 Keyboard and Mouse connector (CN11) 22
2.9 External Keyboard connector (CN12) 23
2.10 CPU Fan connector (CN14) 23
2.11 System FAN connector (CN15 and CN37) 24

2.12 Front Panel connector (CN16, 17, 18, 19, 21&29) 24
Table 2.1: PS/2 or ATX power supply LED status 25
2.13 H/W Monitor Alarm (CN22)..... 26
2.14 USB and LAN ports (CN31 and CN32)..... 27
2.15 CF socket (CN44, optional) 28
2.16 Line-out, Mic-in connector (CN55) 28
2.17 Audio Input from CD-ROM (CD IN; CN56)..... 29
2.18 Aux Line-In connector (AUX IN; CN57) 29
2.19 Modem-In connector (MDM IN; CN58) 30
2.20 Front Panel Audio connector (FP AUDIO; CN59)..... 30
2.21 8-pin Alarm Board connector (CN62) 31
2.22 Case Open connector (CN64) 31
2.23 Connecting to SNMP-1000 Remote Manager 32
2.24 Auxiliary 4-pin Power connector (ATX1) 32
2.25 RS 232/422/485 selection (J13 & J14)..... 32
2.26 Serial Port Pin-out selection Signal (RI)/Power (5V or 12V) (J15)..... 33
2.27 SW1 CPU selection (SW1) 33

Chapter 3 Award BIOS Setup.....36

3.1 Introduction 36
3.2 Entering Setup 37
Figure 3.1: Award BIOS Setup initial screen 37
3.3 Standard CMOS Setup 37
Figure 3.2: Standard CMOS features screen 37
3.4 Advanced BIOS Features 38
Figure 3.3: Advanced BIOS features screen..... 38
3.5 Advanced Chipset Features 40
Figure 3.4: Advanced chipset features screen 41
3.6 Integrated Peripherals..... 43
Figure 3.5: Integrated peripherals..... 43
Table 3.1: COM Port IRQ Assignment..... 45
Table 3.2: COM Port I/O Address 45
3.7 Power Management Setup..... 47
Figure 3.6: Power management setup screen (1)..... 47
Figure 3.7: Power management setup screen (2)..... 49
3.8 PnP/PCI Configurations 50
Figure 3.8: PnP/PCI configurations screen..... 50
3.9 PC Health Status..... 51
Figure 3.9: PC health status screen..... 51
3.10 Spread Spectrum Control 52
Figure 3.10:Spread Spectrum Control screen..... 52
3.11 Password Setting 52

3.12 Save & Exit Setup 53
3.13 Exit Without Saving 53
Chapter 4 Chipset Software Installation Utility 56
4.1 Before you begin 56
4.2 Introduction 56
4.3 Windows XP Driver Setup 57
Chapter 5 VGA Setup (for AIMB-740-6CB1) 62
5.1 Introduction 62
5.2 Dynamic Video Memory Technology 62
5.3 Windows XP Driver Setup 63
Chapter 6 LAN Configuration 70
6.1 Introduction 70
6.2 Features 70
6.3 Installation 71
6.4 Win XP Driver Setup (Intel 82562) 71
Chapter 7 USB 2.0 Configuration 76
7.1 Introduction 76
7.2 Features 76
7.3 Installation 76
Chapter 8 Ultra ATA Storage Driver Setup 84
8.1 Introduction 84
8.2 Features 84
8.3 Windows XP Driver Setup 84
8.4 Displaying Driver Information 87
Chapter 9 Onboard Security Setup 90
9.1 Introduction 90
9.2 Windows XP Driver Setup 90
9.3 Using the OBS Hardware Doctor Utility 93
Appendix A Programming the watchdog timer.....98
A.1 Programming the Watchdog Timer 98
Appendix B Pin Assignments 108
B.1 IDE Hard Drive connector (CN1, CN2) 108
Table B.1: IDE hard drive connector (CN1, CN2) ... 108
B.2 Floppy Drive connector (CN3) 109
Table B.2: Floppy drive connector (CN3) 109
B.3 Parallel Port connector (CN4) 110
Table B.3: Parallel port connector (CN4) 110
B.4 USB connector (CN6) 111
Table B.4: USB1/USB2 connector (CN6) 111

B.5 VGA connector (CN7) 111
Table B.5: VGA connector (CN7) 111
B.6 COM1/COM2 RS-232 Serial Port (CN9, CN10)..... 112
Table B.6: COM1/2 RS-232 serial port (CN9/10).... 112
B.7 Keyboard and Mouse connector (CN11) 113
Table B.7: Keyboard and mouse connector (CN11). 113
B.8 External Keyboard connector (CN12)..... 113
Table B.8: External keyboard connector (CN12) 113
B.9 CPU/System Fan Power connector (CN14/15/37)..... 114
Table B.9: CPU/Sys. Fan Pow. con. (CN14/15/37).. 114
B.10 Power LED (CN16)..... 114
Table B.10: Power LED and keylock con. (CN16) 114
B.11 External Speaker connector (CN17) 115
Table B.11: External Speaker connector (CN17) 115
B.12 Reset connector (CN18)..... 115
Table B.12: Reset connector (CN18)..... 115
B.13 HDD LED connector (CN19) 116
Table B.13: HDD LED connector (CN19) 116
B.14 ATX Soft Power Switch (CN21)) 116
Table B.14: ATX soft power switch (CN21)..... 116
B.15 H/W Monitor Alarm (CN22)..... 117
Table B.15: H/W monitor alarm (CN22)..... 117
B.16 SM Bus connector (CN29)..... 117
Table B.16: SM Bus connector (CN 29)..... 117
B.17 USB ports (CN31 and CN32..... 118
Table B.17: USB port 118
B.18 LAN ports (CN31 and CN32 118
Table B.18: Ethernet 10/100Base-T RJ-45 port 118
B.19 CF socket (CN44) 119
Table B.19: CF socket (CN44) 119
B.20 Line Out, Mic IN connector (CN55)..... 120
B.21 Audio input from CD-ROM (CD IN; CN56)..... 120
Table B.20: Audio-in from CD-ROM (CD IN;CN56) 120
B.22 Aux Line-In connector (AUX IN; CN57)..... 121
Table B.21: Aux Line-In connector (AUX IN; CN57)121
B.23 Modem-In connector (MDM IN; CN58) 121
Table B.22: Modem-In connector (MDM IN; CN58) 121
B.24 Front Panel audio connector (FP AUDIO; CN59)..... 122
Table B.23: Front audio conn (FP AUDIO; CN59).... 122
B.25 8-pin Alarm Board connector (CN62) 122
Table B.24: 8-pin Alarm Board connector (CN62) 122
B.26 Case Open connector (CN64; only AIMB-740-6CB1). 123
Table B.25: Case Open connector (CN64) 123

B.27 Front Panel LAN LED connector (CN65) 123
Table B.26: Front Panel LAN LED con. (CN65) 123
B.28 System I/O Ports..... 124
Table B.27: System I/O ports..... 124
B.29 DMA Channel Assignments..... 125
Table B.28: DMA channel assignments 125
B.30 Interrupt Assignments 125
Table B.29: Interrupt assignments 125
B.31 1st MB Memory Map..... 126
Table B.30: 1st MB memory map..... 126
B.32 PCI Bus Map 126
Table B.31: PCI bus map (for V/VE/E2 version; V upon request) 126
Table B.32: PCI bus map (for VG/G2 version; G2 upon request) 126
Appendix C GPIO Programming Source Code.....128

CHAPTER 1

General Information

Chapter 1 Hardware Configuration

1.1 Introduction

Advantech's AIMB-740-6CB1 series industrial motherboard is designed based on the standard ATX form factor with additional industrial features such as long product life, high reliability and manageability. It is flexible in that it can be installed in a commercial PC chassis or in an industrial grade rack mounting chassis. It meets the requirements of a variety of applications where a commercial motherboard cannot fit.

The AIMB-740-6CB1 utilizes Intel 845GV and supports Socket 478 Pentium® 4/Celeron-D/Mobile Pentium® 4-M (FSB 400/533MHz) up to 3.06 GHz. In addition to a high-speed processor, it supports up to 2GB DDR memory and has 2 DIMM sockets on board.

The AIMB-740-6CB1 comes with the 845GV integrated VGA controller providing superior display performance. Intel 82562 10/100Base-T Ethernet controller is available on the AIMB-740-6CB1 series. The high reliability and excellent performance provided by Intel Ethernet controller are crucial for various network applications. AIMB-740-6CB1 features 6 serial ports and 2 x 8-bit GPIO.

A backup of CMOS data is stored in the Flash memory, which protects BIOS setup data even after a battery failure. Also included is a 255-level watchdog timer, which resets the CPU or generates an interrupt if a program cannot be executed normally. This enables reliable operation in unattended environments. The remote management interface enables the AIMB-740-6CB1 to be managed through Ethernet when it is connected to the SNMP-1000 Remote HTTP/SNMP System Manager.

Note: Some of the features mentioned above are not available with all models. For more information about the specifications of a particular model, see Section 1.3: Specifications.

1.2 Features

1. **Standard ATX form factor with industrial features:** AIMB-740-6CB1 provides industrial features like long product life, reliable operation under wide temperature range, watchdog timer, CMOS backup functions, etc.
2. **6 Onboard serial ports:** 2 of RS 232/422/485, 4 of RS 232.
3. **2 Onboard 8-bit GPIO:** 2 on-board 8-bit GPIO headers.
4. **Supporting Intel Mobile Pentium 4-M CPU:** The Intel Mobile Pentium 4-M CPU is suitable for the applications that require high performance and low power consumption.
5. **Healthy status monitoring and remote management:** System voltage levels, fan speed, CPU temperature are monitored to ensure stable operation. The remote management interface allows the system to be managed through Ethernet when it is connected to the SNMP-1000 Remote HTTP/SNMP System Manager.
6. **BIOS CMOS backup and restore:** When BIOS CMOS setup has been completed, data in the CMOS RAM is automatically backed up to the Flash ROM. This is particularly useful in harsh environments which may cause setup data loss such as battery failure. Upon such an error occurring, BIOS will check the data, and automatically restore the original data for booting.
7. **Automatically power on after power failure:** It is often required to have an unattended system come back to operation when power resumes after a power failure. Advantech's industrial motherboard allows users to set the system to power on automatically without pushing the power on button.

1.3 Specifications

1.3.1 System

- **CPU:** AIMB-740-6CB1 supports CPU: Socket 478 for Pentium® 4/ Celeron-D/Mobile Pentium 4-M, FSB 400/533 MHz. up to 3.06 GHz, FSB 400/533 MHz.
- **L2 Cache:** 256/512/1024 KB fullspeed L2 cache.
- **BIOS:** Award Flash BIOS (4Mb Flash Memory)
- **System Chipset:** Intel® 845GV

- **EIDE hard disk drive interface:** Supports up to four IDE hard disk drives other enhanced IDE devices. Supports PIO mode 4 (16.67 MB/s data transfer rate) and Ultra ATA 100/66/33 (100/66/33 MB/s data transfer rate).
- **Floppy disk drive interface:** Supports up to two floppy disk drives, 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB). BIOS enabled/disabled

1.3.2 Memory

- **RAM:** Up to 2GB in two 184-pin DIMM sockets. Supports DDR200/ 266 SDRAM (AIMB-740-6CB1 supports DDR333).
- **ECC:** AIMB-740-6CB1: not supported, AIMB-740-6CB1: supported

1.3.3 Input/Output

- **PCI Bus:** 5 PCI slots, 32-bit, 33MHz. PCI 2.2 compliant
- **GPIO:** 2 on-board 8-bit GPIO headers.
- **Enhanced parallel port:** Configurable to LPT1, LPT2, LPT3, or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ ECP
- **Serial ports:** 6 serial ports, 2 of RS-232/422/485; 4 of RS 232.
- **Keyboard and PS/2 mouse connector:** Two 6-pin mini-DIN connector are located on the mounting bracket for easy connection to a keyboard and PS/2 mouse.
- **USB port:** Supports up to six USB 2.0 and transmission rate up to 480Mbps. (Six USB ports are available in AIMB-740-6CB1)

1.3.4 VGA interface

- **Interface:**
- Chipset integrated VGA controller, shared system memory 8 to 64 MB; AIMB-740-6CB1 do not support AGP

1.3.5 Ethernet LAN

- Supports single 10/100Base-T
- **Chipset:** Intel® 82562 chipset for 10/100Base-T LAN

1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset or IRQ11. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels).

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0° ~ 60° C (32° ~ 140° F, depending on CPU)
- **Storage temperature:** -20° ~ 70° C (-4° ~ 158° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +5 V, ±12 V
- **Power consumption:** Typical : +3.3V:4.23A, +5V:1.35A , +12V:4.17A (Intel® Pentium® 4 2.4GHz, 512MB DDR 333)
- **Board size:** 304.8 x 228.6 mm (12" x 9")
- **Board weight:** 0.7 kg (1.68 lb)

1.4 Jumpers and Connectors

Connectors on the AIMB-740-6CB1 motherboard link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

Table 1.1: Jumpers

Label	Function
J1	CMOS Clear
J2	Watchdog timer output selection
J13	RS 232/422/485 selection for CN10 (COM2)
J14	RS 232/422/485 selection for CN70 (COM6)
J15	Serial port pin-out selection signal (R1) power (5V or 12V)

Table 1.2: Connectors	
Label	**Function**
CN1	Primary IDE connector
CN2	Secondary IDE connector
CN3	Floppy drive connector
CN4	Parallel port
CN6	USB port 4, 5
CN7	VGA connector (only for AIMB-740-6CB1)
CN9	Serial port: COM1
CN10	Serial port connector: COM2
CN10	Serial port connector: COM2 (RS 232/422/485)
CN23	Serial port connector: COM3 (RS 232)
CN26	Serial port connector: COM4 (RS 232
CN67	Serial port connector: COM5 (RS 232)
CN70	Serial port connector: COM6 (RS 232/422/285)
CN11	PS/2 keyboard and mouse connector
CN12	External keyboard connector
CN14	CPU FAN connector
CN15	System FAN connector 1
CN16	Power LED and Keyboard Lock
CN17	External speaker
CN18	Reset connector
CN19	HDD LED connector
CN21	ATX soft power switch (PS_ON)
CN22	HW Monitor Alarm Close: Enable OBS Alarm Open: Disable OBS Alarm
CN29	SM BUS Connector PIN1: SMB_DATA PIN2: SMB_CLOCK

Table 1.2: Connectors	
CN31	USB port 0, 1 & LAN1
CN32	USB port 2, 3 & LAN2
CN37	System FAN connector 2
CN44	CF socket (Optional)
CN55	Line Out, Mic IN connector
CN56	CD IN (Audio input from CD-ROM)
CN57	AUX IN connector
CN58	MDM IN connector
CN59	FP AUDIO connector
CN62	8-pin Alarm Board connector
CN64	Case Open connector
CN65	Front Panel LAN LED connector (AIMB-741-B)
CN93	8-bit GPIO header
CN94	8-bit GPIO header
ATX1	ATX 12V Auxiliary power connector
ATX2	ATX power connector

1.5 Board Layout: Jumper and Connector Locations

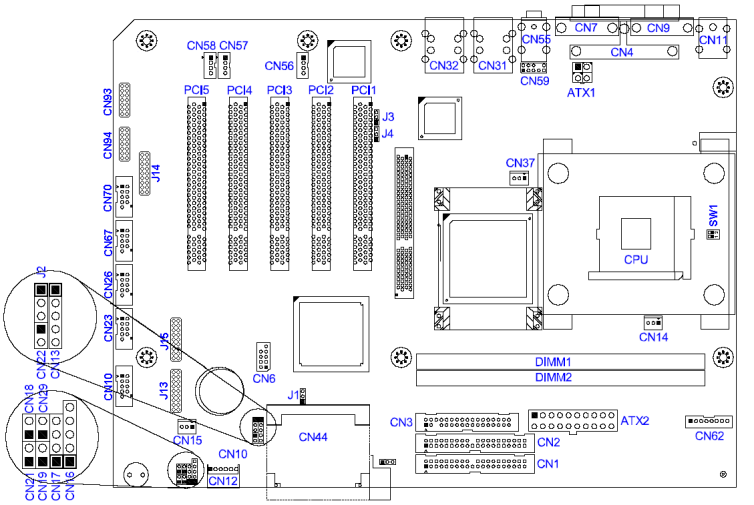


Figure 1.1: AIMB-740-6CB1 Jumpers and Connectors

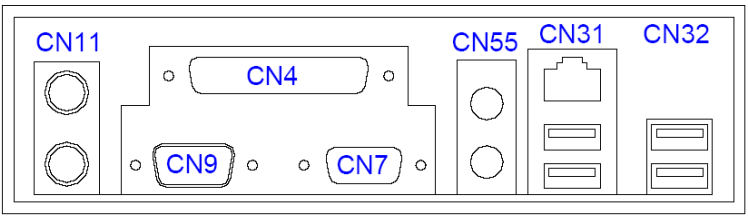


Figure 1.2: I/O Connectors

1.6 AIMB-740-6CB1 Block Diagram

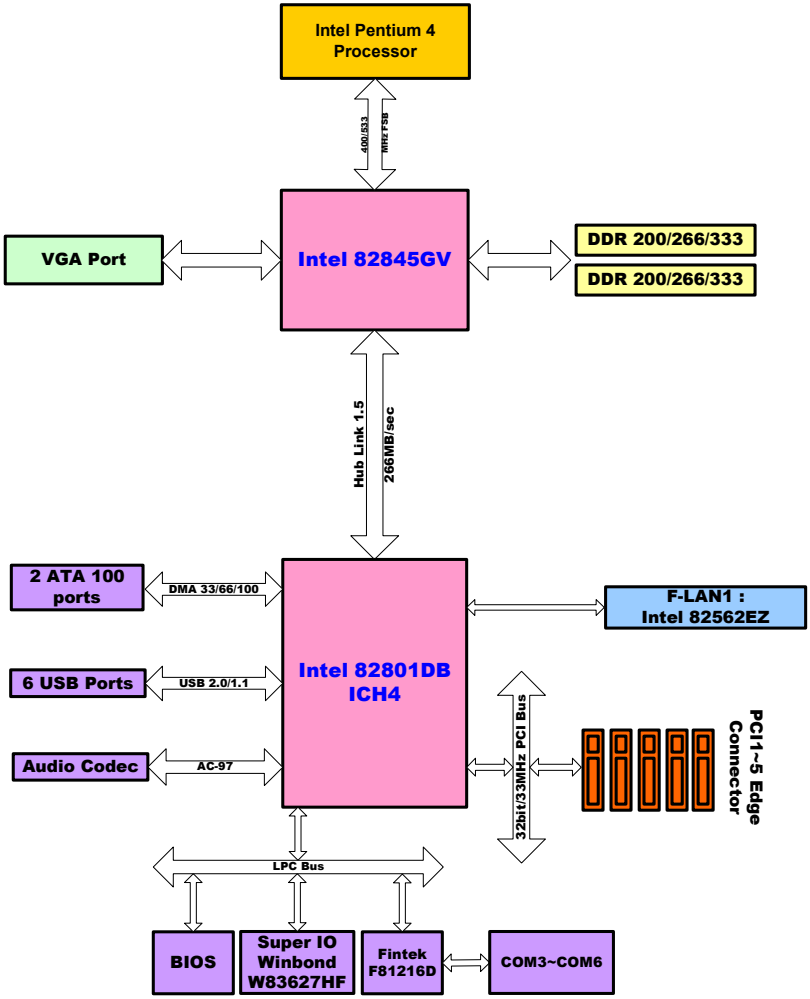


Figure 1.3: AIMB-740-6CB1 Block Diagram

1.7 Safety Precautions

Warning! *Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.*

Caution! *Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

Caution! *The computer is provided with a battery-powered Real-time Clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.*

1.8 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboards's default settings and your options for each jumper.

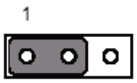
1.8.1 How to set jumpers

You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" (or turn ON) a jumper, you connect the pins with the clip. To "open" (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS clear (J1)

The AIMB-740-6CB1 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set J1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1.3: CMOS (J1)

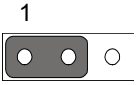
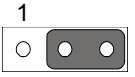
Function	Jumper Setting
* Keep CMOS data	 1-2 closed
Clear CMOS data	2-3 closed

* default setting

1.8.3 Watchdog timer output (J2)

The AIMB-740-6CB1 contains a watchdog timer that will reset the CPU or send a signal to IRQ11 in the event the CPU stops processing. This feature means the AIMB-740-6CB1 will recover from a software failure or an EMI problem. The J2 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

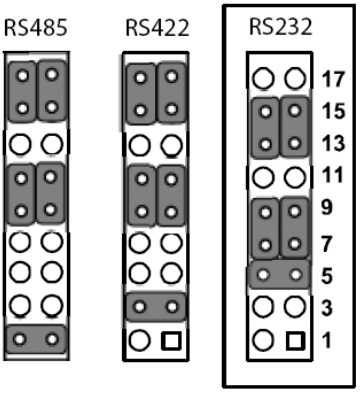
Table 1.4: Watchdog timer output (J2)

Function	Jumper Setting
IRQ11	 1-2 closed
* Reset	 2-3 closed

* default setting

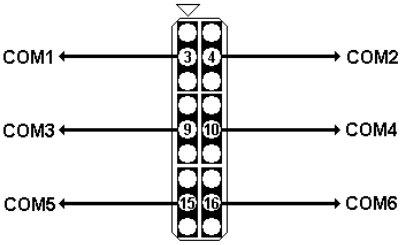
Note: The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.

1.8.4 RS 232/422/485 Selection

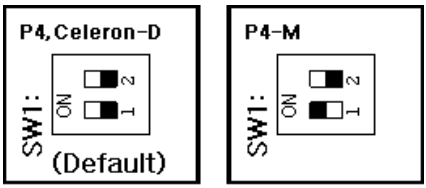


1.8.5 J15: Serial port pin out selection signal (RI)/power (5V or 12V)

(User's can use jumper settings to change pin outs of the RI pins of COM1~COM6.)



1.8.6 SW1 CPU Type Selection



1.9 System Memory

The top-left edge of the AIMB-740-6CB1 contains two sockets for 184-pin dual in-line memory modules (DIMMs). Both two sockets use 2.5 V double-data-rate synchronous DRAMs (DDR SDRAM). DIMMs are available in capacities of 64, 128, 256, 512 MB, or 1 GB. The sockets can be filled in any combination with DIMMs of any size, giving your AIMB-740-6CB1 single board computer between 64 MB and 2 GB of memory. Use the following table to calculate the total DRAM memory within your computer:

Table 1.5: DIMM module allocation table

Socket number	184-pin DIMM memory
1	64, 128, 256, 512 MB, or 1GB)
2	64, 128, 256, 512 MB, or 1GB)

1.9.1 Sample calculation: DIMM memory capacity

Suppose you install a 512 MB DIMM into your AIMB-740-6CB1's socket 1 and a 512 MB DIMM into sockets 2. Your total system memory is 1 GB, calculated as follows:

Table 1.6: DIMM mem capacity sample calculation

Socket number	184-pin DIMM memory	Total Memory
1	512 MB x 1	512 MB
2	512 MB x 1	512 MB

Total memory 1 GB

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

1.11 Cache Memory

Since the second-level (L2) cache has been embedded into the Intel® socket 478 Pentium® 4//Celeron-D/Mobile Pentium® 4-M/Celeron® processor, you do not have to take care of either SRAM chips or SRAM modules. The built-in second-level cache in the processor yields much higher performance than the external cache memories. The cache size in the Intel ® Pentium ® 4 processor is 256/512 KB. In the Celeron-D/Celeron CPU, the cache size is 256/128KB. In the Mobile Pentium 4(R)-M CPU, the cache size is 512KB.

1.12 Processor Installation

The AIMB-740-6CB1 is designed for Intel Pentium® 4//Celeron-D/ Mobile Pentium® 4-M/Celeron® (socket 478).

Note: Slim Heatsink & Fan is available from Advantech. Please contact with Advantech's sales representative if needed.

Step 1 : Lift the processor socket lever

Step 2 : Align the corner having the triangle marking on the processor with the corner where the lever is attached to the socket

Step 3 : Lower the lever to its original position

1.13 PCI Bus Routing Table

Table 1.7: PCIBus Routing Table:		
PCI Slot	ID SEL	PCI Interrupt
PCI1	AD31	INT B, C, D, A
PCI2	AD30	INT C, D, A, B
PCI3	AD29	INT D, A, B, C
PCI4	AD28	INT A, B, C, D
PCI5	AD27	INT B, C, D, A

Table 1.8: 1U PCI Riser Card Bus Routing Table		
PCI Slot	**ID SEL**	**PCI Interrupt**
PCI1	AD31	INT B, C, D, A

Table 1.9: 2U PCI Riser Card Bus Routing Table		
PCI Slot	**ID SEL**	**PCI Interrupt**
PCI1	AD31	INT B, C, D, A
PCI2	AD30	INT C, D, A, B
PCI3	AD29	INT D, A, B, C

CHAPTER 2

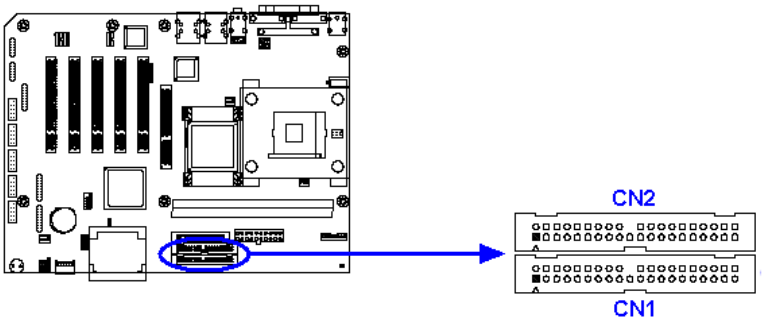
Connecting Peripherals

Chapter 2 Connecting Peripherals

2.1 Introduction

You can access most of the connectors from the top of the board while it is installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

2.2 Primary and Secondary IDE connectors (CN1/2)



You can attach up to four IDE (Integrated Drive Electronics) drives to the AIMB-740-6CB1's built-in controller. The primary (CN1) and secondary (CN2) connectors can each accommodate two drives.

Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector CN1 or CN2 on the motherboard. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner). See Chapter 1 for help finding the connector.

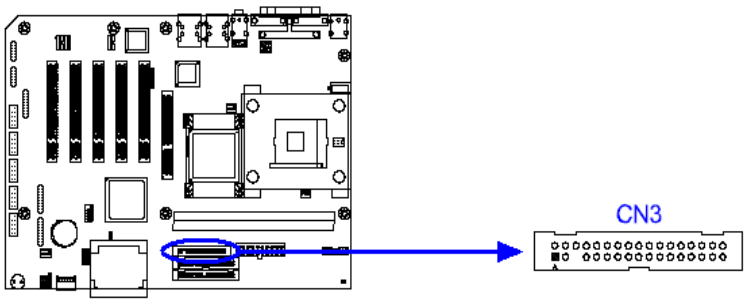
Unlike floppy drives, IDE hard drives can connect in either position on the cable. If you install two drives to a single connector, you will need to set one as the master and the other as the slave. You do this by setting the jumpers on the drives. If you use just one drive per connector, you should set each drive as the master. See the documentation that came with your drive for more information.

Connect the first hard drive to the other end of the cable. Wire 1 on the cable should also connect to pin 1 on the hard drive connector, which is labeled on the drive circuit board. Check the documentation that came with the drive for more information.

Connect the second hard drive to the remaining connector (CN2 or CN1), in the same way as described above. The secondary IDE shares the same resource with CF (CompactFlash) socket.

CN61 is used to set CF as master mode or slave mode. While setting CF as master, the other IDE device connected to secondary IDE can work as a slave device only and vice versa.

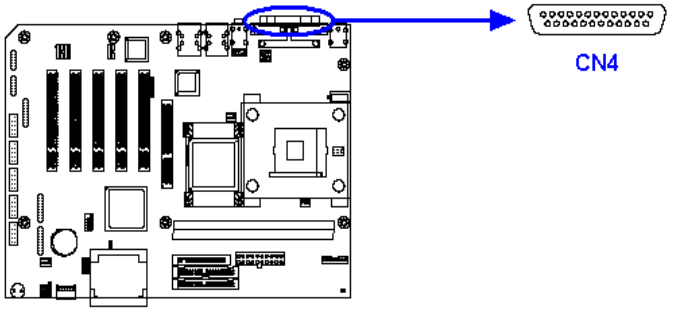
2.3 Floppy Drive connector (CN3)



You can attach up to two floppy disk drives to the AIMB-740-6CB1's onboard controller. You can use 3.5" (720 KB, 1.44 MB) drives.

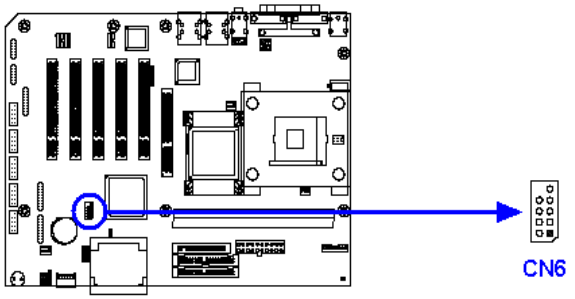
The motherboard comes with a 34-pin daisy-chain drive connector cable. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of 34-pin flat-cable connector (usually used for 3.5" drives). The set on the end (after the twist in the cable) connects to the A: floppy drive. The set in the middle connects to the B: floppy drive.

2.4 Parallel Port (CN4)



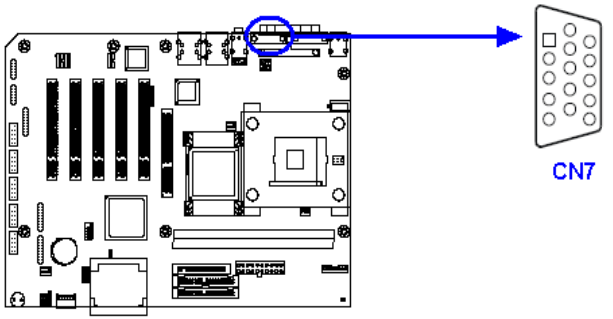
The parallel port is normally used to connect the motherboard to a printer. The AIMB-740-6CB1 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, CN4.

2.5 USB Ports (CN6)



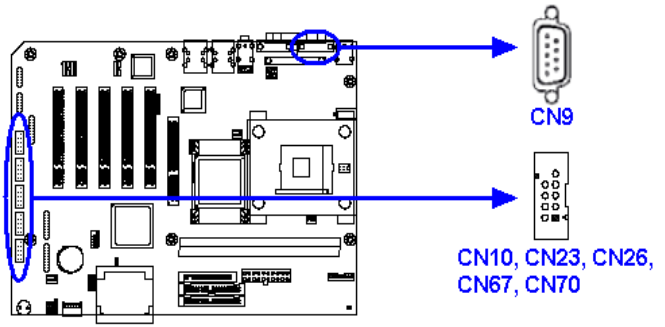
The AIMB-740-6CB1's provides up to six ports of USB (Universal Serial Bus) interface, which gives complete Plug & Play and hot swapping for up to 127 external devices.The USB interface complies with USB Specification Rev. 2.0 support transmission rate up to 480 Mbps and is fuse-protected. The USB interface can be disabled in the system BIOS setup.

2.6 VGA connector (CN7)



The AIMB-740-6CB1 includes a VGA interface that can drive conventional CRT displays. CN7 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for CRT connector CN7 are detailed in Appendix B.

2.7 Serial Ports (COM1: CN9, COM2: CN10, COM3: CN23, COM4: CN26, COM5: CN67, COM6: CN70)



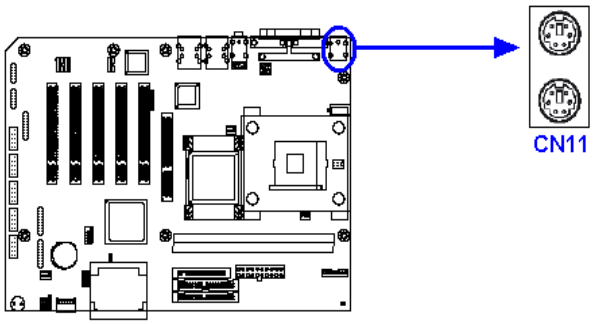
The AIMB-740-6CB1 offers six serial ports, CN9 as COM1 and CN10 as COM2, CN23 as COM3, CN26 as COM4, CN67 as COM5, CN70 as COM6.. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

The IRQs for COM1 and COM2 are fixed in IRQ3 and IRQ4, while those of COM3~COM6 can ONLY be chosen from IRQ5, IRQ10 and IRQ11,

using other IRQs may cause unexpected resource conflict. If you want to disable the ports or change the parameters, you can do this in the system BIOS setup.

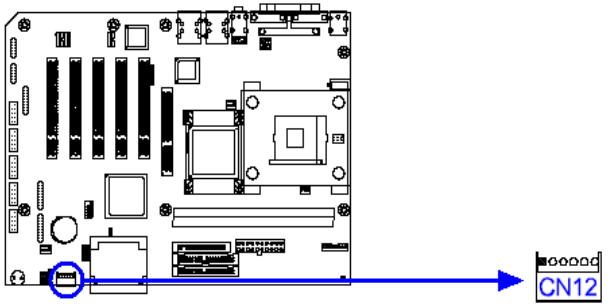
Different devices implement the RS-232/422/485 standards in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

2.8 PS/2 Keyboard and Mouse connector (CN11)



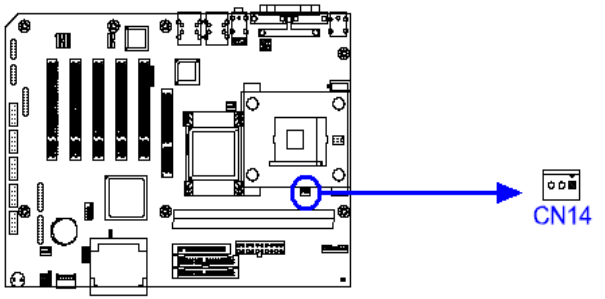
Two 6-pin mini-DIN connectors (CN11) on the motherboard provide connection to a PS/2 keyboard and a PS/2 mouse, respectively.

2.9 External Keyboard connector (CN12)



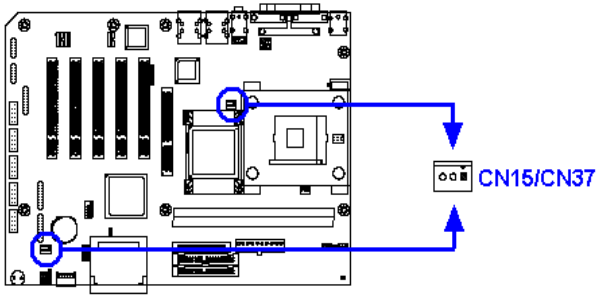
In addition to the PS/2 mouse/keyboard connector on the AIMB-740-6CB1's rear plate, there is also an extra onboard external keyboard connector. This gives system integrators greater flexibility in designing their systems.

2.10 CPU Fan connector (CN14)



If fan is used, this connector supports cooling fans of 500mA (6W) or less.

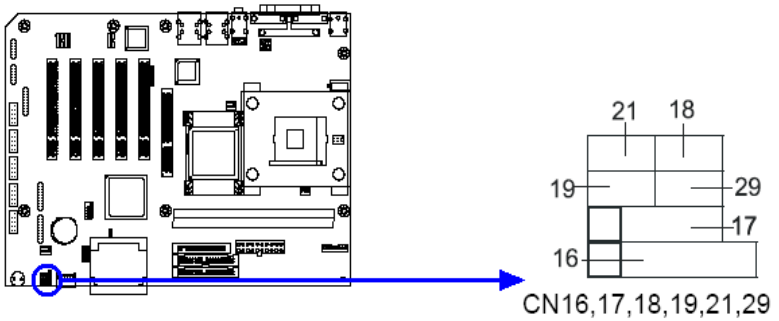
2.11 System FAN connector (CN15 and CN37)



If fan is used, this connector supports cooling fans of 500mA (6W) or less.

2.12 Front Panel connector (CN16, 17, 18, 19, 21&29)

There are several external switches to monitor and control the AIMB-740-6CB1.



2.12.1 Power LED and Keyboard Lock (CN16)

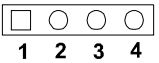
CN16 is a 5-pin connector for the power on LED. Refer to Appendix B for detailed information on the pin assignments. If a PS/2 or ATX power supply is used, the system's power LED status will be as indicated below:

Table 2.1: PS/2 or ATX power supply LED status

Power mode	LED (PS/2 power)	LED (ATX power)
System On	ON	ON
System Suspend	Fast flashes	Fast Flashes
System Off	OFF	Slow Flashes

2.12.2 External speaker (CN17)

CN17 is a 4-pin connector for an external speaker. If there is no external speaker, the AIMB-740-6CB1 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 3-4 as closed



2.12.3 Reset (CN18)

Many computer cases offer the convenience of a reset button. Connect the wire from the reset button

2.12.4 HDD LED (CN19)

You can connect an LED to connector CN19 to indicate when the HDD is active.

2.12.5 ATX Soft Power switch (CN21)

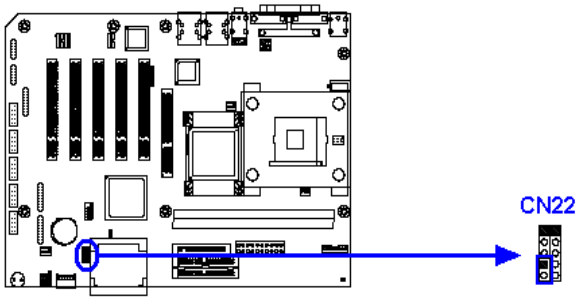
If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to CN21. This connection enables you to turn your computer on and off.

2.12.6 SM Bus connector (CN29)

This connector is reserved for Advantech's SNMP-1000 HTTP/SNMP Remote System Manager. The SNMP-1000 allows users to monitor the internal voltages, temperature and fans from a remote computer through an Ethernet network.

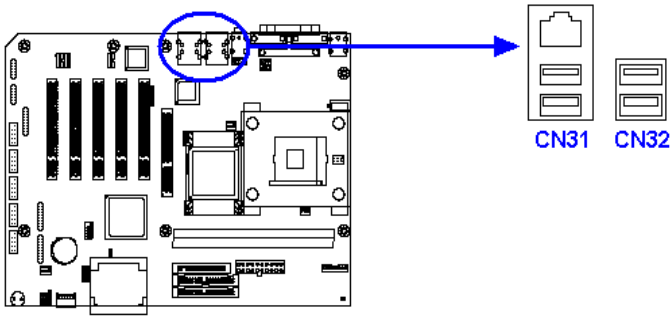
CN29 can be connected to CN19 of SNMP-1000. Please be careful about the pin assignments, pin 1 must be connected to pin 1 and pin2 to pin 2 on both ends of cable.

2.13 H/W Monitor Alarm (CN22)



To enable or disable the function of buzzer.

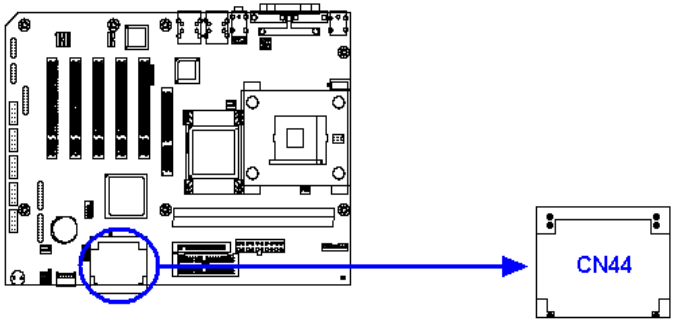
2.14 USB and LAN ports (CN31 and CN32)



The AIMB-740-6CB1 provides up to six USB (Universal Serial Bus) ports, which gives complete Plug & Play and hot swapping for up to 127 external devices.The USB interface complies with USB Specification Rev. 2.0 support transmission rate up to 480 Mbps and is fuse-protected. The USB interface can be disabled in the system BIOS setup.

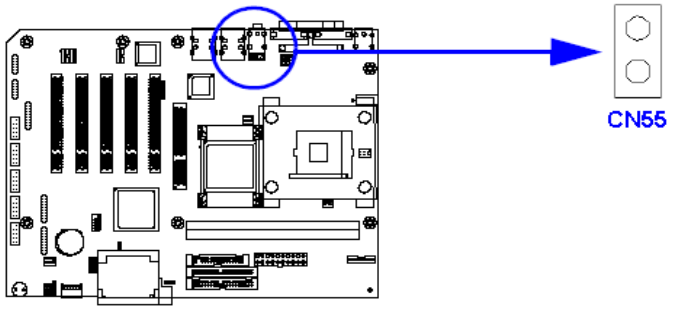
The AIMB-740-6CB1 is equipped with one or two high-performance Ethernet interfaces, which are fully compliant with IEEE 802.3/u 10/100 Mbps CSMA/CD standards. Also, AIMB-740-6CB1 provides the option of supporting single or dual 10/10/1000 Mbps Ethernet LANs. They are supported by all major network operating systems. The RJ-45 jacks on the rear plate provide convenient 10/100 Base-T or 10/100/1000 Base-T RJ-45 operation.

2.15 CF socket (CN44, optional)



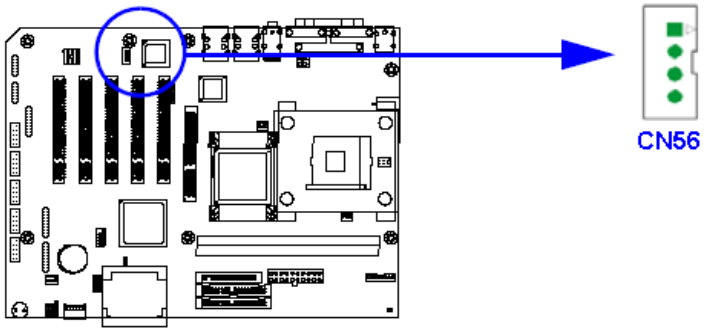
The AIMB-740-6CB1 provides one optional CF socket, which is compatible with type I and type II CF cards. The CF socket shares the same resource with secondary IDE interface. CF card is only available for master mode. While setting CF as master, the other IDE device connected to secondary IDE can work as a slave device only.

2.16 Line-out, Mic-in connector (CN55)



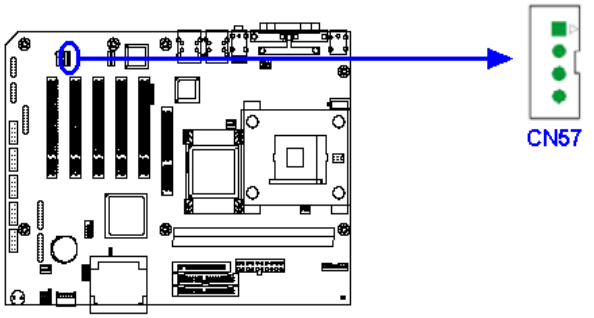
The line out is to output the audio signal to external audio device, like speakers or headphones. The Mic IN is to input the audio signal via microphones.

2.17 Audio Input from CD-ROM (CD IN; CN56)



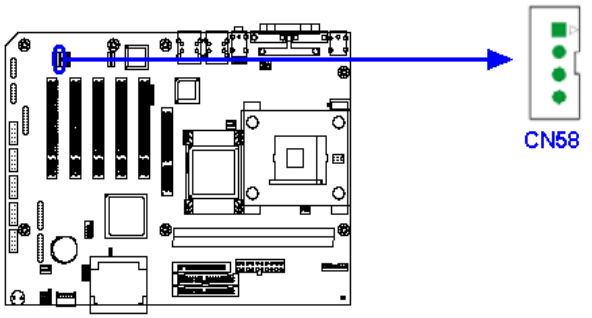
The CD IN is a connector for CD-ROM to input the audio signal.

2.18 Aux Line-In connector (AUX IN; CN57)



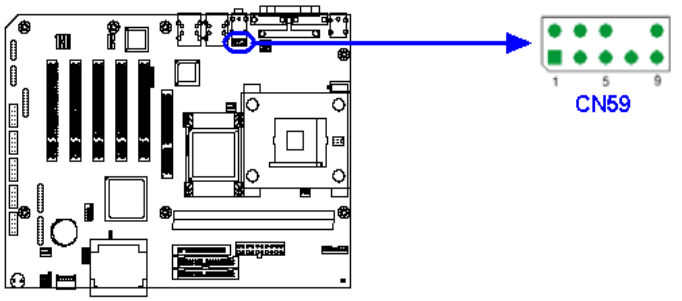
The connector is for audio device with Line-in connector.

2.19 Modem-In connector (MDM IN; CN58)



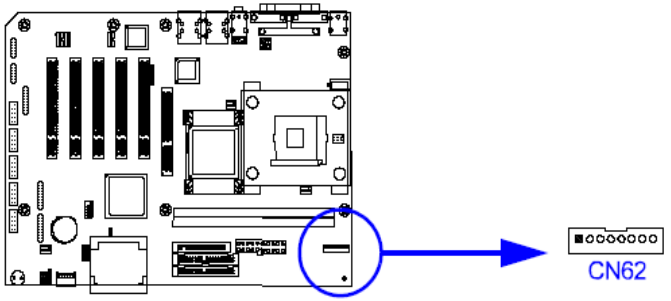
The connector is for modem with internal audio connector.

2.20 Front Panel Audio connector (FP AUDIO; CN59)



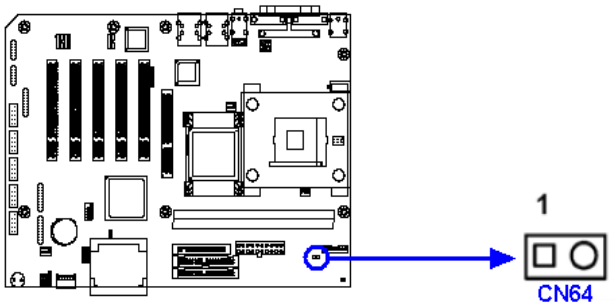
The FPAUDIO is a front panel audio connector compliant with Intel® Front Panel I/O Connectivity Design Guide. To direct the audio signal output to the rear audio ports, the 5 and 6 pins, 9 and 10 pins must be shorted by jumper to activate the rear panel audio function.

2.21 8-pin Alarm Board connector (CN62)



The 8-pin alarm board connector is for Advantech chassis with alarm board.

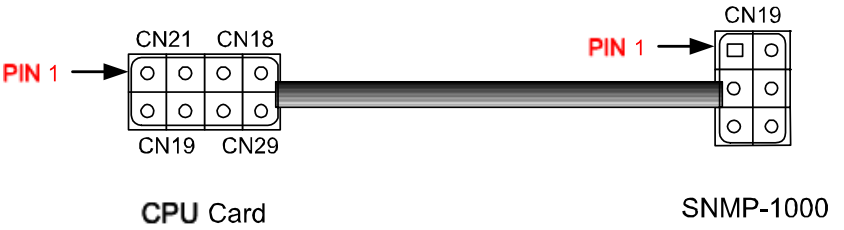
2.22 Case Open connector (CN64)



The 2-pin case open connector is for chassis with case open censor. While opening the case, the buzzer on motherboard will ring.

2.23 Connecting to SNMP-1000 Remote Manager

Use the 6-pin to 8-pin cable to connect the motherboard to SNMP-1000. This cable comes with the SNMP-1000.

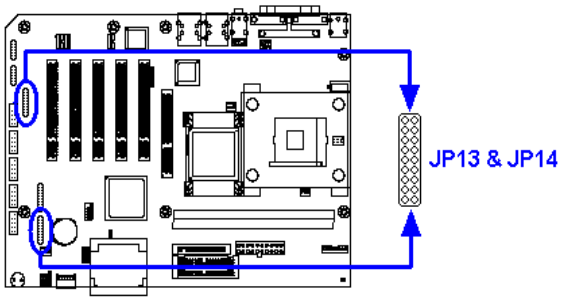


2.24 Auxiliary 4-pin Power connector (ATX1)

To ensure the sufficiency of power supply for Pentium® 4 motherboard, one auxiliary 4 pin power connector is available on AIMB-740-6CB1. It is strongly suggested to use ATX1 while the system is unstable.

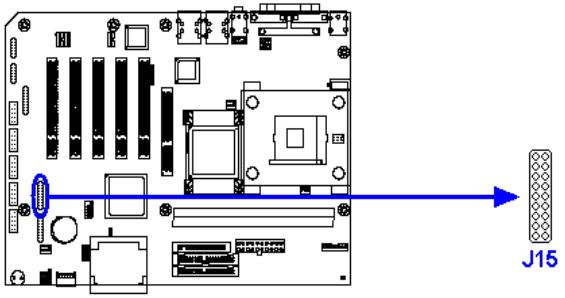
2.25 RS 232/422/485 selection (J13 & J14)

The COM2 (CN10) and COM6 (CN70) support RS 232/422/485 modes, the user can select among these modes using J13 (for CN10) and J14 (for CN70) jumper settings.



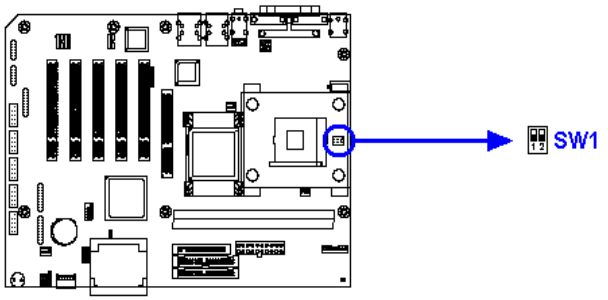
2.26 Serial Port Pin-out selection Signal (RI)/Power (5V or 12V) (J15)

User's can use jumper settings to change pin outs of the RI pins of COM1~COM6.



2.27 SW1 CPU selection (SW1)

Make sure the switch setting of SW1 correspond to the CPU type you are using, if the switch setting of SW1 is incorrect, the system will NOT boot to avoid from CPU damage.



CHAPTER 3

Award BIOS Setup

Chapter 3 Award BIOS Setup

3.1 Introduction

Award's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed memory (CMOS RAM) so that it retains the setup information when the power is turned off.

3.1.1 CMOS RAM Auto-backup and Restore

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to Flash ROM. If operation in harsh industrial environment cause a soft error, BIOS will recheck the data in CMOS RAM and automatically restore the original data in Flash ROM to CMOS RAM for booting.

Note: If you intend to change the CMOS setting without restoring the previous backup, you have to click on "DEL" within two seconds of the "CMOS checksum error..." display screen message appearing. Then enter the "Setup" screen to modify the data. If the "CMOS checksum error..."message appears again and again, please check to see if you need to replace the battery in your system.

3.2 Entering Setup

Turn on the computer and press <Del> to allow you to enter the BIOS setup.

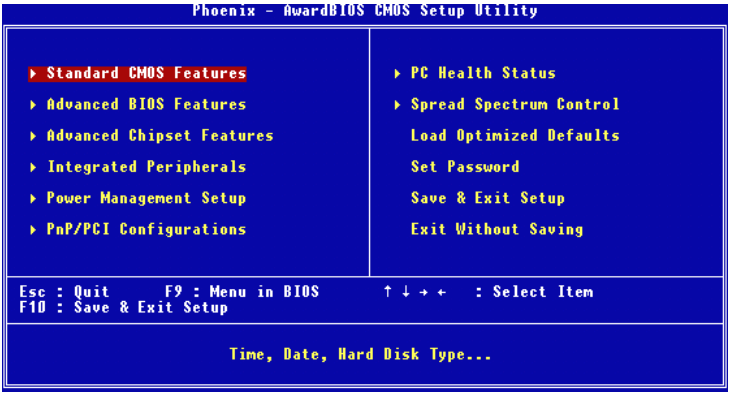


Figure 3.1: Award BIOS Setup initial screen

3.3 Standard CMOS Setup

Choose the “Standard CMOS Features” option from the “Initial Setup Screen” menu, and the screen below will be displayed. This menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.

Figure 3.2: Standard CMOS features screen

3.4 Advanced BIOS Features

The “Advanced BIOS Features” screen appears when choosing the “Advanced BIOS Features” item from the “Initial Setup Screen” menu. It allows the user to configure the AIMB-740-6CB1 according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time

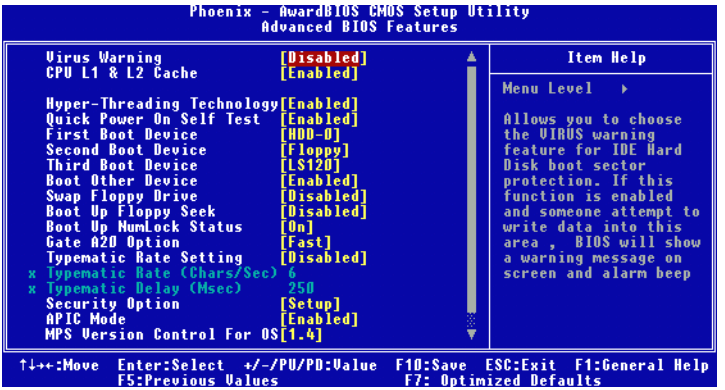


Figure 3.3: Advanced BIOS features screen

3.4.1 Virus Warning

Allows you to choose the VIRUS warming feature for IDE hard disk boot sector protection. If this function is enabled and someone attempts to write data into this area, BIOS will show a warning message on screen and alarm beep. The commands are “Enabled” or “Disabled.”

3.4.2 CPU L1 & L2 Cache

Enabling this feature speeds up memory access. The commands are “Enabled” or “Disabled.”

3.4.3 Hyper-Threading Technology

While using CPU with Hyper-Threading technology, you can select "Enabled" to enable Hyper Threading Technology in OS which supports Hyper-Threading Technology or select "Disabled" for other OS which do not support HT technology.

3.4.4 Quick Power On Self Test

Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.

3.4.5 First/Second/Third Boot Device

The BIOS tries to load the OS with the devices in the sequence selected. Choices are: "Floppy", "LS120", "HDD-0", "SCSI", "CDROM", "HDD-1", "HDD-2", "HDD-3", "ZIP100", "USB-FDD", "USB-ZIP", "USB-CDROM", "USB-HDD", "LAN", "Disabled".

3.4.6 Swap Floppy Drive

If the system has two floppy drives, choose "Enabled" to assign physical drive B to logical drive A and vice-versa. The commands are “Enabled” or “Disabled.”

3.4.7 Boot UP Floppy Seek

Selection of the command “Disabled” will speed the boot up. Selection of “Enabled” searches disk drives during boot up.

3.4.8 Boot Up NumLock Status

This feature selects the “power on” state for NumLock. The commands are “Enabled” or “Disabled.”

3.4.9 Gate A20 Option

"Normal": A pin in the keyboard controller controls GateA20.

"Fast" (Default): Lets chipset control GateA20.

3.4.10 Typematic Rate Setting

The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are “Enabled” or “Disabled.” Enabling allows the typematic rate and delay to be selected.

3.4.11 Typematic Rate (Chars/Sec)

BIOS accepts the following input values (characters/second) for typematic rate: 6, 8, 10, 12, 15, 20, 24, 30.

3.4.12 Typematic Delay (msec)

Typematic delay is the time interval between the appearance of two consecutive characters, when holding down a key. The input values for this category are: 250, 500, 750, 1000 (msec).

3.4.13 Security Option

Select whether the password is required every time the system boots or only when you enter setup.

"System" The system will not boot, and access to Setup will be denied if the correct password is not entered at the prompt.

"Setup" The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select "PASSWORD SETTING" in the main menu. At this point, you will be asked to enter a password. Simply press <Enter> to disable security. When security is disabled, the system will boot, and you can enter Setup freely.

3.4.14 APIC Mode

This setting enables the APIC mode, the choice is "Disabled" or "Enabled."

3.4.15 MPS Version Control For OS

This reports if an FDD is available for Windows 95. The selections are "1.1" or "1.4."

3.4.16 OS Select For DRAM > 64MB

Select OS2 only if you are running OS/2 operating system with greater than 64MB of RAM on the system. Commands are "Non-OS2" or "OS2."

3.5 Advanced Chipset Features

By choosing the "Advanced Chipset Features" option from the "Initial Setup Screen" menu, the screen below will be displayed. This sample screen contains the manufacturer's default values for the AIMB-740-6CB1, as shown in Figure 3-4:

Note: DRAM default timings have been carefully chosen and should ONLY be changed if data is being lost. Please first contact technical support.

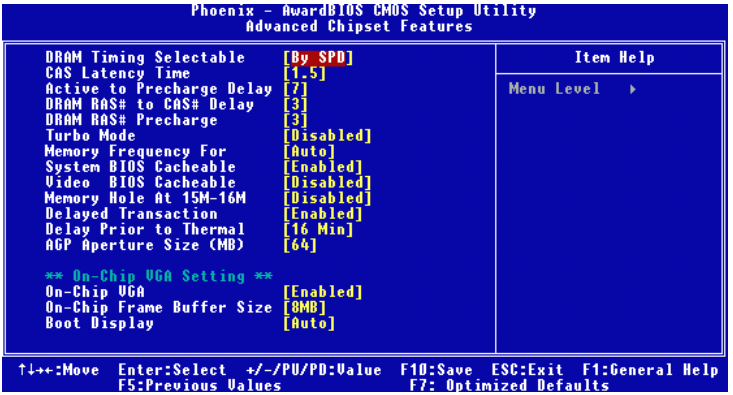


Figure 3.4: Advanced chipset features screen

3.5.1 DRAM Timing Selectable

This item allows you to control the DRAM speed. The selections are "Manual" or "By SPD".

3.5.2 CAS Latency Time

This controls the latency between DDR RAM read command and the time that the data actually becomes available. Leave this on the default setting. The options are "1.5", "2", "2.5" or "3".

3.5.3 Active to Precharge Delay

This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs. The Choice: "7", "6" and "5".

3.5.4 DRAM RAS# to CAS# Delay

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB. The Choice: "3" and "2".

3.5.5 DRAM RAS# Precharge

This controls the idle clocks after issuing a precharge command to DRAM. Leave this on the default setting. The choice : "3" and "2".

3.5.6 Turbo Mode

The Choice : "Enabled" and "Disabled".

3.5.7 Memory Frequency
To adjust the frequency of memory. The choice : "PC100", "PC133" and "Auto".

3.5.8 System BIOS Cacheable
Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may occur. The Choices: "Enabled", "Disabled".

3.5.9 Video Bios Cacheable
Selecting Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may occur. The Choices: "Enabled", "Disabled".

3.5.10 Memory Hole At 15M-16M
Enabling this feature reserves 15 MB to 16 MB memory address space for ISA expansion cards that specifically require this setting. This makes memory from 15 MB and up unavailable to the system. Expansion cards can only access memory up to 16 MB. The default setting is “Disabled.”

3.5.11 Delayed Transaction
The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1. The Choice: "Enabled", "Disabled".

3.5.12 Delay Prior to Thermal
Select Enabled if user wants to lower the CPU speed when CPU temperature is too high. The choice: "Enabled", "Disabled".

3.5.13 AGP Aperture Size (MB)
Select the size of Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The Choice : 4, 8, 16, 32, 64, 128, 256.

3.5.14 On-Chip VGA
User can disable onboard VGA controller by selecting "Disabled"

3.5.15 On-Chip Frame Buffer Size
User can select frame buffer size. Option is "8MB" and "1MB".

3.6 Integrated Peripherals

3.6.1 On-Chip Primary/Secondary PCI IDE

IDE Primary (Secondary) Master/Slave PIO/UDMA Mode (Auto) Each channel (Primary and Secondary) has both a master and a slave, making four IDE devices possible. Because each IDE device may have a different Mode timing (0, 1, 2, 3, 4), it is necessary for these to be independent. The default setting “Auto” will allow auto detection to ensure optimal performance.

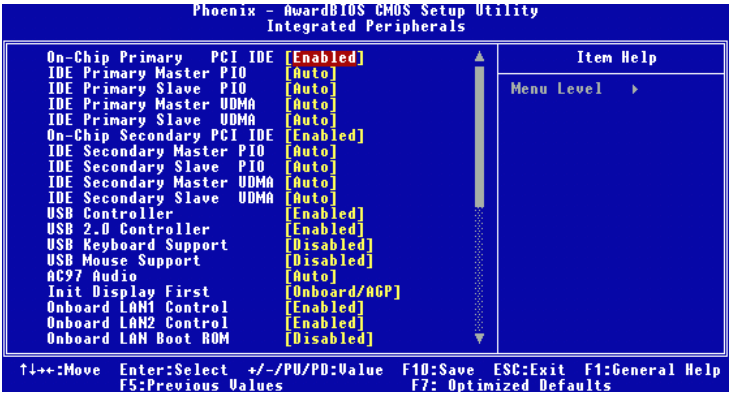


Figure 3.5: Integrated peripherals

3.6.2 USB Controller

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The choices: "Enabled", "Disabled". Choose "Enabled" to adjust "USB 2.0 Controller", "USB Keyboard Support" and "USB Mouse Support".

3.6.3 USB 2.0 Controller

This entry is for disable/enable USB2.0 controller only. The BIOS itself may/may not have high speed USB support. If the BIOS has high speed USB support built in, the support will be automatically turn on when high speed device were attached. The Choice : "Enabled" and "Disabled".

3.6.4 USB Keyboard/Mouse Support

Select Enabled if user plan to use an USB keyboard. The choice: "Enabled", "Disabled".

3.6.5 AC97 Audio
Select Disable if you do not want to use AC-97 audio. Option is "Auto", "Disabled".

3.6.6 Init Display First
This item allows you to choose which one to activate first, PCI Slot or on-chip VGA. The choices: "PCI Slot", "Onboard/AGP".

3.6.7 Onboard LAN1 Control
Options are "Enabled" and "Disabled" Select Disable if user does not want to use onboard LAN controller1

3.6.8 Onboard LAN2 Control
Options are "Enabled" and "Disabled" Select Disable if user does not want to use onboard LAN controller2

3.6.9 IDE HDD Block Mode
If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

3.6.10 Onboard LAN Boot ROM
Decide whether to invoke the boot ROM of the onboard LAN chip. The Choice: "Disabled", "LAN1".

3.6.11 POWER ON Function
To select the method to power on the system. The Choice : Password, Hot KEY, Any KEY, Button ONLY, Keyboard 98.

3.6.12 Hot Key Power ON
To setup which Hot Key has the Power ON function. The Choice : "Ctrl-F1", "Ctrl-F2", "Ctrl-F3", "Ctrl-F4", "Ctrl-F5", "Ctrl-F6", "Ctrl-F7", "Ctrl-F8", "Ctrl-F9", "Ctrl-F10", "Ctrl-F11", "Ctrl-F12".

3.6.13 Onboard FDC Controller
When enabled, this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to Disabled.

3.6.14 Onboard Serial Port 1 ~ 6

Please refer to the below COM port IRQ and I/O address assignment, inappropriate assignment may cause unexpected resource conflict.

Table 3.1: COM Port IRQ Assignment

COM Port	IRQ
COM 1 COM 2	IRQ 3 / IRQ 4
COM 3 COM 4 COM 5 COM 6	IRQ 5 / IRQ 10 / IRQ 11

Table 3.2: COM Port I/O Address

COM Port	I/O Address
COM 1 COM 2 COM 3 COM 4	3F8h / 3E8h / 2F8h / 2E8h
COM 5 COM 6	4F8h / 4E8h

3.6.15 UART Mode Select

This item allows you to select UART mode. The choices: "IrDA", "ASKIR", "Normal".

3.6.16 RxD, TxD Active

This item allows you to determine the active of RxD, TxD. The Choices: “Hi, Hi,” “Lo, Lo,” “Lo, Hi,” “Hi, Lo.”

3.6.17 IR Transmission Delay

This item allows you to enable/disable IR transmission delay. The choices: "Enabled", "Disabled".

3.6.18 UR2 Duplex Mode

This item allows you to select the IR half/full duplex function. The choices: "Half", "Full".

3.6.19 Use IR Pins

The Choice : "RxD2, TxD2", "IR-Rx2Tx2".

3.6.20 Onboard Parallel Port

This field sets the address of the on-board parallel port connector. You can select either "378/IRQ7", "278/IRQ5", "3BC/IRQ7", or "Disabled". If you install an I/O card with a parallel port, make sure there is no conflict in the address assignments. The single board computer can support up to three parallel ports, as long as there are no conflicts for each port.

3.6.21 Parallel Port Mode

This field allows you to set the operation mode of the parallel port. The setting “Normal” allows normal speed operation, but in one direction only. “EPP” allows bidirectional parallel port operation at maximum speed. “ECP” allows the parallel port to operate in bi-directional mode and at a speed faster than the maximum data transfer rate. “ECP + EPP” allows normal speed operation in a two-way mode.

3.6.22 EPP Mode Select

This field allows you to select EPP port type 1.7 or 1.9. The choices:

"EPP1.9", "EPP1.7".

3.6.23 ECP Mode Use DMA

This selection is available only if you select “ECP” or “ECP + EPP” in the Parallel Port Mode field. In ECP Mode Use DMA, you can select DMA channel 1, or DMA channel 3. Leave this field on the default setting.

3.6.24 PWRON After PWR-Fail

To setup the status of system after power fail. The "Off" will keep system power off after power fail, the "On" will boot up the system after fail, and the "Former-Sts" will return to the status before power fail.

3.7 Power Management Setup

The power management setup controls the single board computer's "green" features to save power. The following screen shows the manufacturer's defaults:

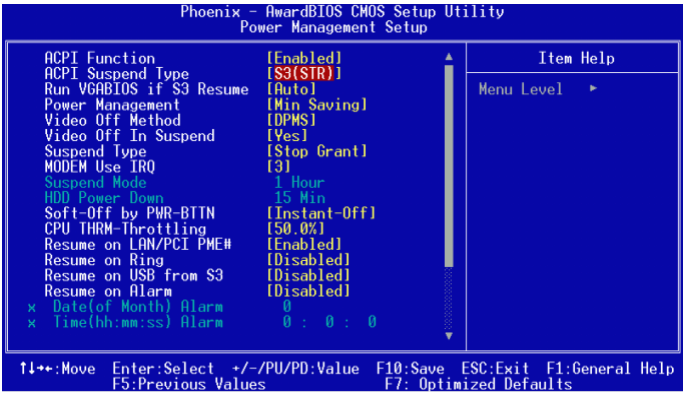


Figure 3.6: Power management setup screen (1)

3.7.1 ACPI function

The choice: "Enabled", "Disabled".

3.7.2 ACPI Suspend Type

The Choice : "S1(POS)", and "S3(STR)". While selecting "S3(STR)", the "Run VGABIOS if S3 Resume" and "Resume on USB from S3" will be active for selection.

3.7.3 Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. HDD Power Down
2. Suspend Mode

There are three selections for Power Management, and they have fixed mode settings.

Min Saving	Minimum power management., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max Saving	Maximum power management., Suspend Mode = 1 min., and HDD Power Down = 1 min.

User Defined (Default)	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

3.7.4 Video Off Method

To select the method to off the video. The Choice : "Blank Screen", "V/H SYNC+ Blank", "DPMS".

3.7.5 Video Off In Suspend

When system is in suspend, video will turn off.

3.7.6 Suspend Type

The Choice: "Stop Grant", "PwrOn Suspend".

3.7.7 Modem Use IRQ

This determines the IRQ in which the MODEM can use.The choices: "3", "4", "5", "7", "9", "10", "11", "NA".

3.7.8 Soft-Off by PWR-BTTN

If you choose “Instant-Off”, then pushing the ATX soft power switch button once will switch the system to “system off” power mode. You can choose “Delay 4 sec.” If you do, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button momentarily (for less than 4 seconds) will switch the system to “suspend” mode.

3.7.9 CPU THRM-Throttling

This field allows you to select the CPU THRM-Throttling rate. The choices: "12.5%", "25.0%", "37.5%", "50.0%", "62.5%", "75.0%", "87.5%".

3.7.10 Resume on LAN/PCI PME#

To enable or disable the function to wake up the system by PCI card. The Choice : "Enabled", "Disabled".

3.7.11 Resume on Ring

This item allows you to wake up the system via COM port from the remote host. The choices: "Enabled", "Disabled".

3.7.12 Resume on Alarm

The Choice : "Enabled", "Disabled".

3.7.13 Primary IDE 0 (1) and Secondary IDE 0 (1)

When Enabled, the system will resume from suspend mode if Primary IDE 0 (1) or Secondary IDE 0 (1) is active. The choice: "Enabled", "Disabled".

3.7.14 FDD, COM, LPT PORT

When Enabled, the system will resume from suspend mode if FDD, COM port, or LPT port is active. The choice: "Enabled", "Disabled".

3.7.15 PCI PIRQ [A-D]#

When Enabled, the system will resume from suspend mode if interrupt occurs. The choice: "Enabled", "Disabled".

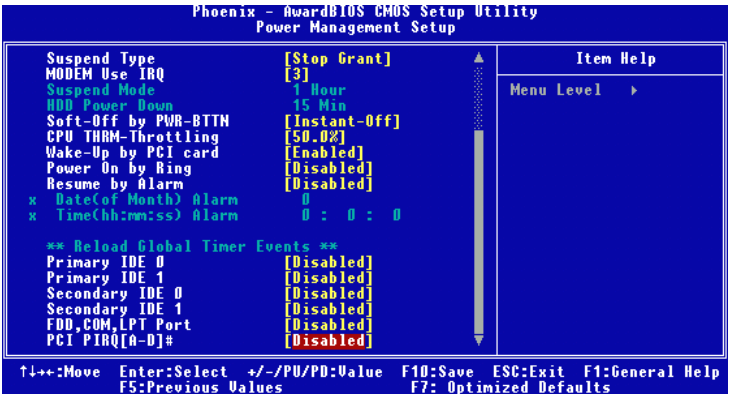


Figure 3.7: Power management setup screen (2)

3.8 PnP/PCI Configurations

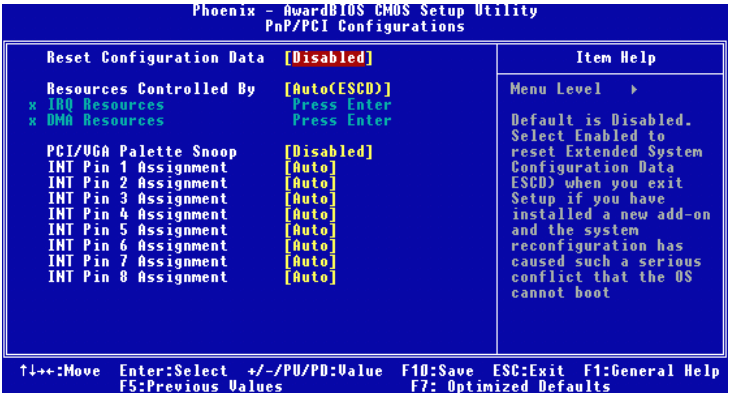


Figure 3.8: PnP/PCI configurations screen

3.8.1 Reset Configuration Data

Default is Disable. Select Enable to reset Extended System Configuration Data (ESCD) if you have installed a new add-on and system configuration has caused such a conflict that OS cannot boot.

3.8.2 Resources Controlled By

The commands here are "Auto (ESCD)" or “Manual.” Choosing “manual” requires you to choose resources from each following sub-menu. "Auto (ESCD)" automatically configures all of the boot and Plug and Play devices but you must be using Windows 95 or above.

3.8.3 PCI/VGA Palette Snoop

This is left at “Disabled.”

3.9 PC Health Status

3.9.1 CPU Warning Temperature

This item will prevent the CPU from overheating. The choices are: "Disabled", "50C/122F", "53C/127F", "56C/133F", "60C/140F", "63C/145F", "66C/151F", "70C/158F".

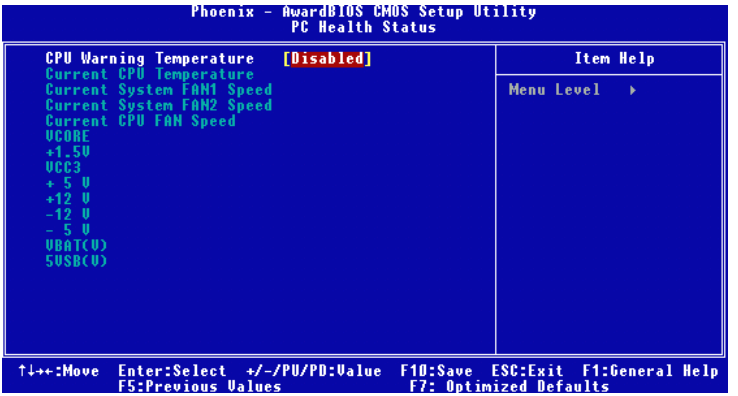


Figure 3.9: PC health status screen

3.9.2 Current CPU Temperature

This shows you the current CPU temperature.

3.9.3 Current System FAN1/FAN2 Speed

This shows you the current System FAN1/FAN2 operating speed.

3.9.4 Current CPUFAN Speed

This shows you the current CPUFAN operating speed.

3.9.5 VCORE, +1.5V, VCC3, +5V, +12V, -12V, -5V, VBAT(V), 5VSB(V)

This shows you the voltage of VCORE, +1.5V, VCC3, +5V, +12V, -12V, -5V, VBAT(V), and 5VSB(V).

3.10 Spread Spectrum Control

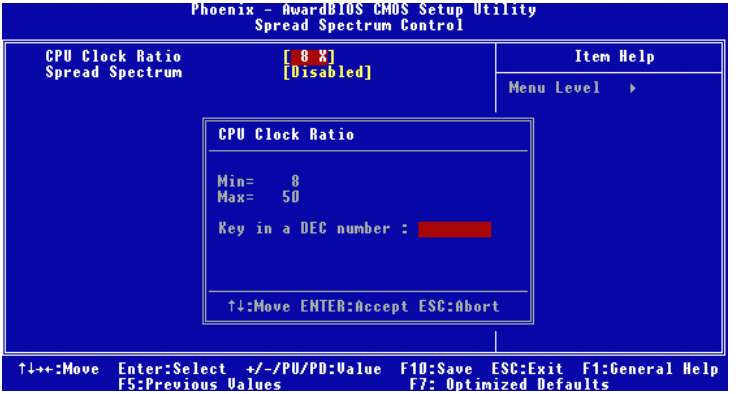


Figure 3.10: Spread Spectrum Control screen

3.10.1 CPU Clock Ratio

Key in a DEC number to setup the CPU Clock Ratio. (Min=8; Max=50). This item only shows up under some special situations.

3.10.2 Spread Spectrum

To enable/disable the spread spectrum. The Choice : "Enabled", "Disabled".

3.11 Password Setting

To change the password:

1. Choose the "Set Password" option from the "Initial Setup Screen" menu and press <Enter>.

   The screen will display the following message:

Please Enter Your Password

Press <Enter>.

2. If the CMOS is good or if this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

Please Confirm Your Password

Enter the current password and press <Enter>.

3. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters.

Remember, to enable the password setting feature, you must first select either “Setup” or “System” from the “Advanced BIOS Features” menu.

3.12 Save & Exit Setup

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

3.13 Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

CHAPTER 4

Chipset Software Installation Utility

Chapter 4 Chipset Software Installation Utility

4.1 Before you begin

To facilitate the installation of the enhanced display device drivers and utility software, you should read the instructions in this chapter carefully before you attempt installation. The device drivers for the AIMB-740-6CB1 board are located on the software installation CD. The auto-run function of the driver CD will guide and link you to the utilities and device drivers under a Windows system. The Intel® Chipset Software Installation Utility is not required on any systems running Windows NT 4.0. Updates are provided via Service Packs from Microsoft*.

Note: The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user's manual before performing the installation.

4.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs to the target system the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- IDE Ultra ATA 100/66/33 interface support.
- USB 1.1 support (USB 2.0 driver needs to be installed separately)
- Identification of Intel ® chipset components in the Device Manager.
- Integrates superior video features. These include filtered sealing of

720 pixel DVD content, and MPEG-2 motion compensation for software DVD

Note: This utility is used for the following versions of Windows system, and it has to be installed before installing all the other drivers:

Windows 98SE

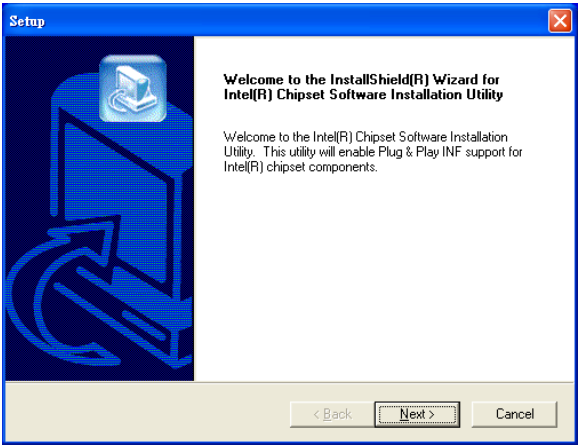
Windows 2000

Windows Me

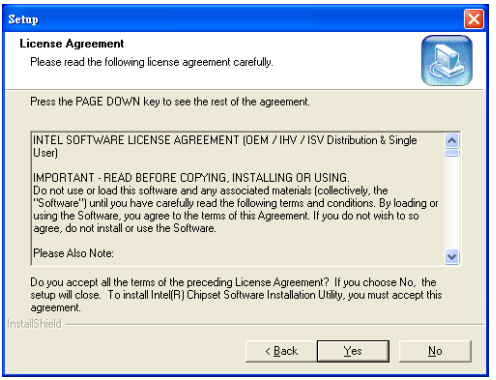
Windows XP

4.3 Windows XP Driver Setup

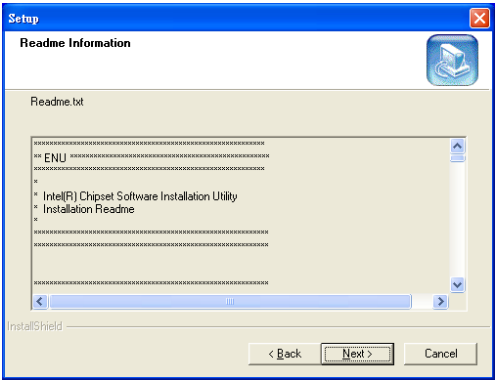
1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears. Move the mouse cursor over the "Auto" button under the "CSI UTILITY" heading, a message pops up telling you to install the CSI utility before other device drivers. Click on this button. Taking Windows XP as example.
2. Click "Next" when you see the following message



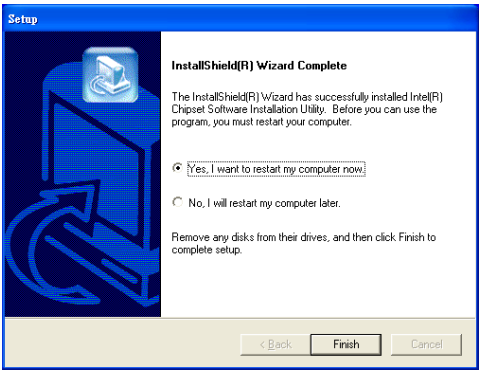
3. Click "Yes" when you see the following message.



4. Click "Next" when you see the following message.



5. When the following message appears, click "Finish" to complete the installation and restart Windows.



CHAPTER 5

VGA Setup

Chapter 5 VGA Setup (for AIMB-740-6CB1)

5.1 Introduction

The AIMB-740-6CB1 has VGA onboard, you need to install the VGA driver to enable the function.

The Intel® 845GV Graphics Memory Controller Hub (the 845GV GMCH) is Intel's first memory controller hub with integrated graphics for the Intel Pentium® 4 processor. The 845GV GMCH, with its new architecture graphics engine, delivers not only high 2D/3D graphics performance, but also provides efficient, high bandwidth communication channels connecting the processor, the memory, the I/O subsystem, and other components together to deliver a stable mainstream desktop platform solution. The features include:

• Built-in 2D/3D VGA controller.

- Use Intel® Extreme Graphics Architecture
- Integrated 350MHz RAMDAC that can directly drive a progressive scan analog monitor up to a resolution of 2048x1536 at 60MHz
- Up to 1600 x 1200 x 32 resolution at 85 Hz refresh.
- H/W motion compensation assistance for s/w MPEG 2 decoding.
- Software DVD at 30 fps Full Screen.

Note :

1. It is strongly suggested to install DirectX 8.1 or later version if your operating system is Windows 98.

2. The AIMB-740-6CB1 is VGA integrated, the VGA driver will be installed with the operating system. If you want to use an add-on VGA card, you must remove theVGA driver first, then plug in the add-on VGA card and install the driver for that.

5.2 Dynamic Video Memory Technology

The following is quoted from "Intel® 845GV Chipset Dynamic Video Memory Technology" Rev. 1.2 June 2002":

Dynamic Video Memory Technology (DVMT) is an enhancement of the UMA concept, wherein the optimum amount of memory is allocated for balanced graphics and system performance, through Direct AGP known

as Non-Local Video Memory (NLVM), and a highly efficient memory utilization scheme. DVMT ensures the most efficient use of available memory regardless of frame buffer or main memory sizing for maximum 2D/3D Graphics performance. DVMT dynamically responds to system requirements, and applications demands, by allocating the proper amount of display, texturing and buffer memory after the operating system has booted. For example, a 3D application when launched may require more vertex buffer memory to enhance the complexity of objects, or more texture memory to enhance the richness of the 3D environment. The operating system views the integrated graphics driver as an application, which uses Direct AGP to request allocation of additional memory for 3D applications, and returns the memory to the operating system when no longer required.

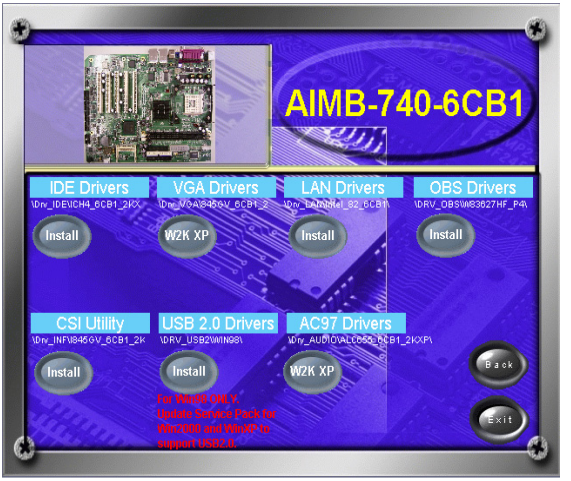
The Intel Extreme Graphics Driver determines the size of the pre-allocated memory needed and will make additional Non-Local Video Memory requests to achieve the amount needed for the display and application requirement. The video memory size in the Intel® 845GV chipset varies and is determined using several factors. The key factors are system resources and system activity. The maximum video memory is up to 64MB SDRAM

5.3 Windows XP Driver Setup

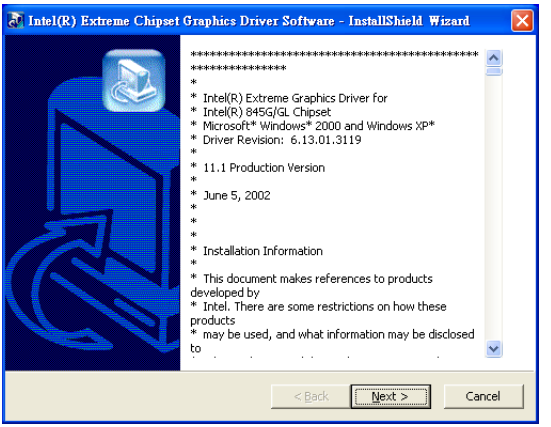
Note: Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Under the "VGA DRIVERS" heading, click on one of the buttons (labeled "W2K XP", "WIN9X ME", and "WIN NT" respectively) according to the operating system you are using. The following

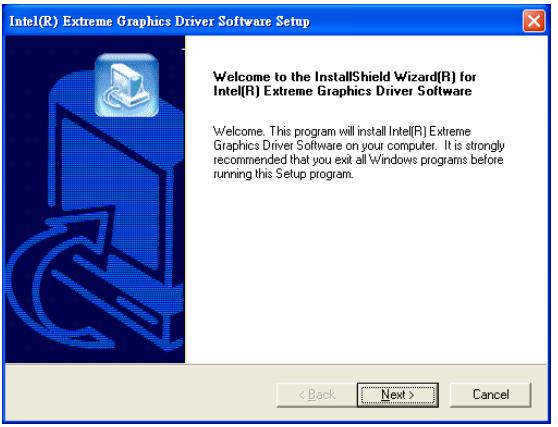
installation procedure is for Windows XP. For other operating systems, please follow the on-screen installation guide



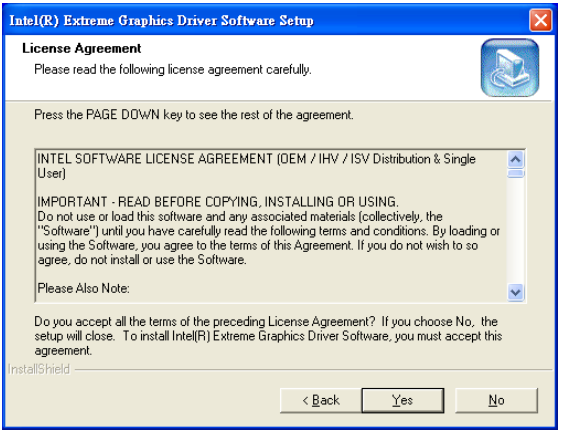
1. Please click on "Next" to continue the installation



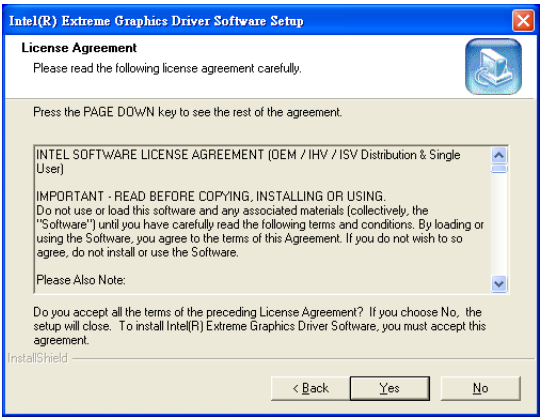
2. You will see a welcome window. Please chick on "Next" to continue the installation.



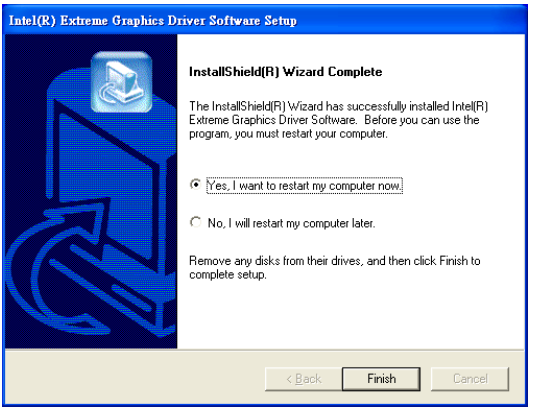
3. Click "Yes" when you see the following message.



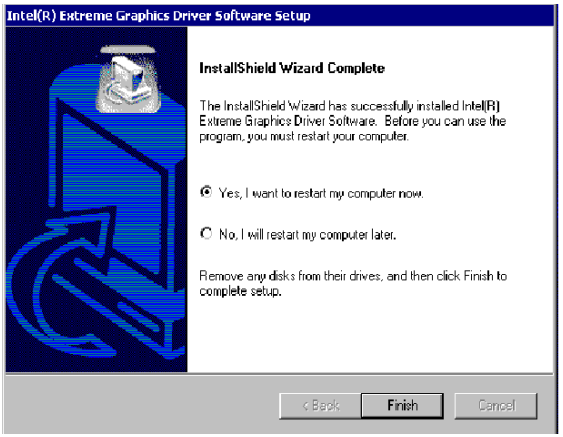
4. Click on "Yes" to continue the installation



5. Click "Finish" to complete the installation and restart the computer now or later.



6. When the following message appears, you can choose to restart the computer now or later.



CHAPTER 6

LAN Configuration

Chapter 6 LAN Configuration

6.1 Introduction

The AIMB-740-6CB1 features the 32-bit 10/100/1000 Mbps Ethernet network interface. This interface supports bus mastering architecture and auto-negotiation features. Therefore standard twisted-pair cabling, with an RJ-45 connector for 10 Mbps and 100 Mbps connections, can be used. Extensive driver support for commonly-used network systems is also provided.

6.2 Features

- Intel 82562 10/100Base-T Ethernet LAN controller.
- Supports Wake-on-LAN remote control function.
- PCI Bus Master complies with PCI Rev. 2.2.
- MAC & PHY (10/100 Mbps) interfaces.
- Complies with 100Base-TX, and 10Base-T applications.
- Fully supports 100Base-TX, and 10Base-T operation.
- Single RJ-45 connector gives auto-detection of 10 Mbps and 100 Mbps network data transfer rates and connected cable types.
- Plug and Play.
- Enhancements on ACPI & APM.
- Complies with PCI Bus Power Management Interface Rev. 1.1.
- ACPI Rev. 2.0, and Device Class Power Management Rev. 1.0.

6.3 Installation

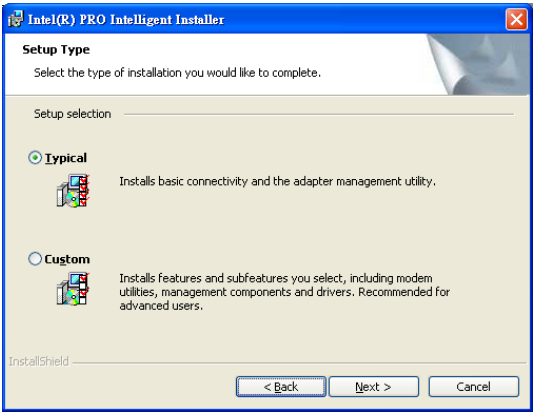
Note: Before installing the LAN drivers, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.

The AIMB-740-6CB1's onboard Ethernet interface supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides driver setup procedure for the operating system you are using.

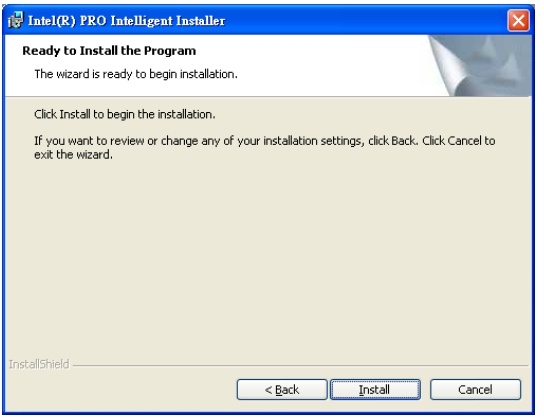
6.4 Win XP Driver Setup (Intel 82562)

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Under the "LAN Drivers" heading, click on the "Manual" to open file manager, then click "SETUP.EXE" to run the installation procedure.
2. Select "I accept the terms in the license agreement" and click "Next" to continue.

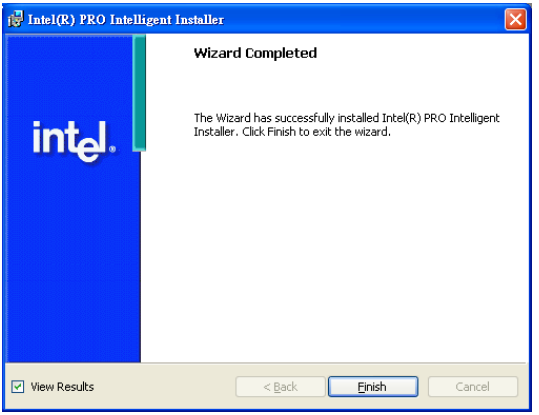
3. Select "Typical" and click "Next" to continue.

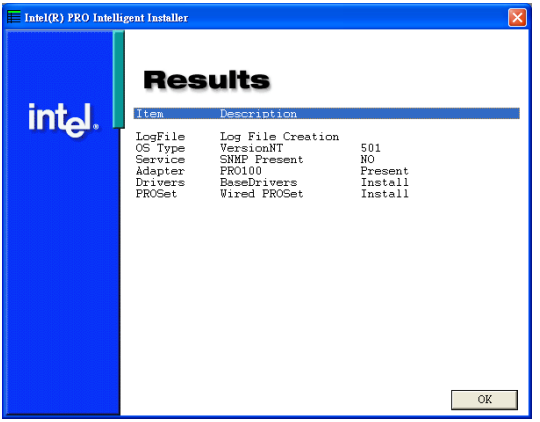


4. Click "Install" to start the installation procedure.



5. Click "Finish" to complete the installation and show the results.





CHAPTER 7

USB 2.0 Configuration

Chapter 7 USB 2.0 Configuration

7.1 Introduction

The AIMB-740-6CB1 is designed with Intel ICH4 which supports both USB1.1 and USB 2.0 high-speed transmission. It still remains the standard with today's USB device. High-speed USB 2.0 provides data transfer up to 480Mb/s which is 40 times faster than USB 1.1. It is ideal for today's speed-demanding I/O peripherals.

7.2 Features

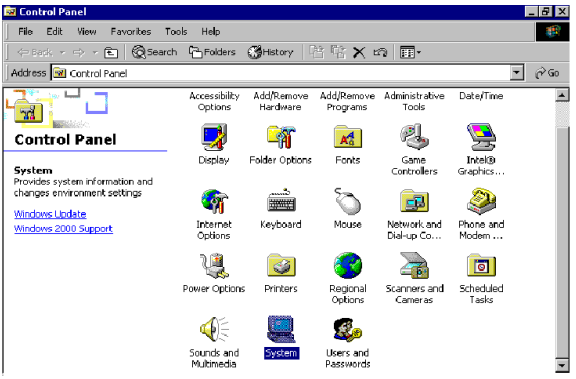
- Provides data transmission rate up to 480Mb/s
- Offer 40 greater bandwidth than USB 1.1
- Offers complete compatibility with current USB device

7.3 Installation

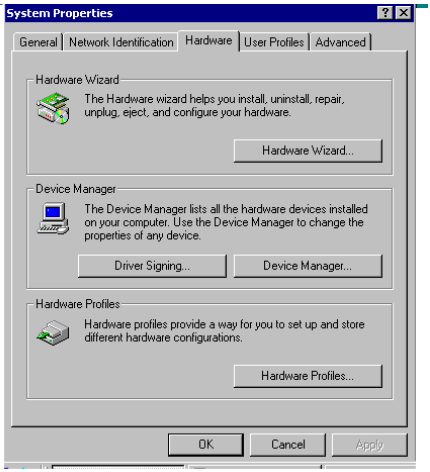
Note: Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.

Note: USB 2.0 driver is not available for Windows 98SE/ME from AIMB-740-6CB1 driver CD. Under these operating systems, the USB device will operate at USB 1.1 speeds.

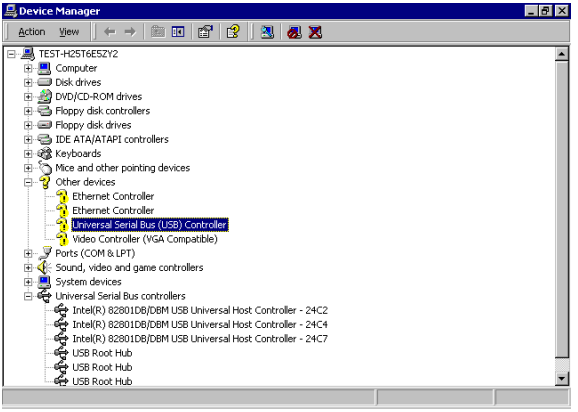
1. 1. From Windows 2000, select Start and click on Setting. In the window of Setting, click on icon System.



2. Choose the option "Hardware", and then click on "Device Manager"



3. In Device Manager, choose "USB Controller" and then double click.

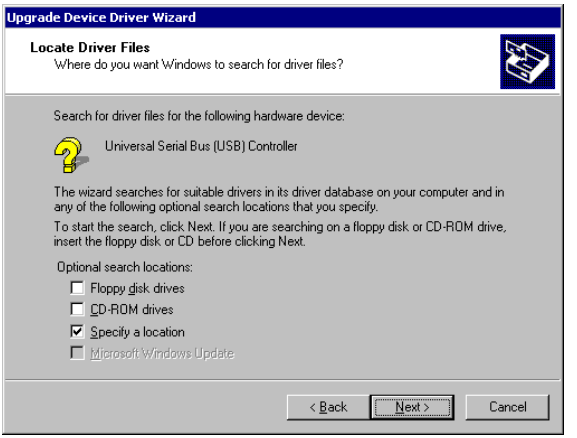


4. Choose the option "Driver" and then click on "Update Driver".

5. In Upgrade Device Driver Wizard, click on "Next".

6. In Upgrade Device Wizard, choose "search for a suitable device for my driver" and then click on " Next".

7. Tick "Specify a location" and click "Next"



8. In the following windows, please specify the location "D:\Drv_USB\w2k" and then click on "OK".

9. In the following window, please click on "Finish" to complete USB driver installation.

CHAPTER 8

Ultra ATA Storage Driver Setup

Chapter 8 Ultra ATA Storage Driver Setup

8.1 Introduction

This driver takes advantage of the latest Intel ® Ultra ATA controller features to improve both storage subsystem performance and overall system performance. A useful diagnostic tool, Intel Ultra ATA Companion®, shows technical information of the ATA subsystem.

8.2 Features

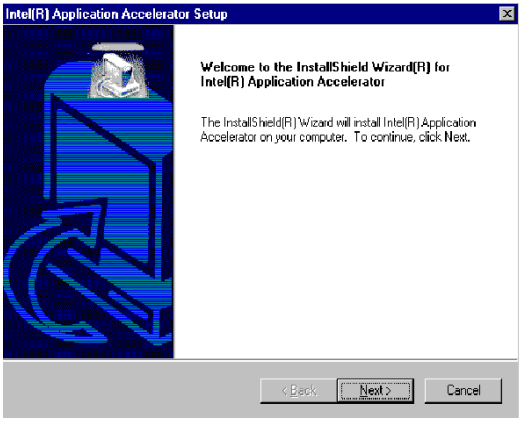
- The driver enables fast Ultra ATA transfers by default.
- Users no longer have to manually enable DMA transfers for each ATA and/or ATAPI peripheral devices.
- Each ATA channel has independent device timings/transfers which allows PIO-only and DMA-capable devices to share the same ATA controller cable, where one is the master and the other the slave, without restricting transfer mode to PIO-only for both devices.
- Technical details of the ATA subsystem can be viewed via use of the application.
- Drivers are optimized.

8.3 Windows XP Driver Setup

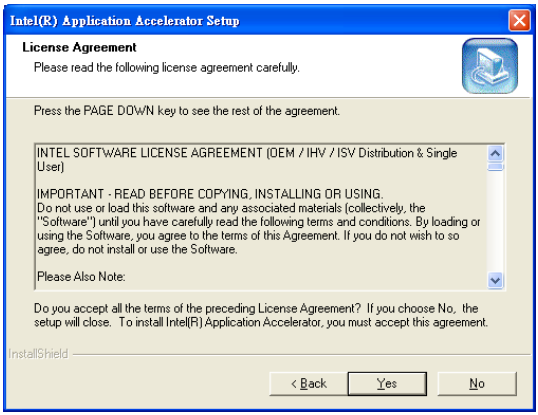
Note: Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears. Under the "IDE DRIVERS" heading, click on the "Install" button.

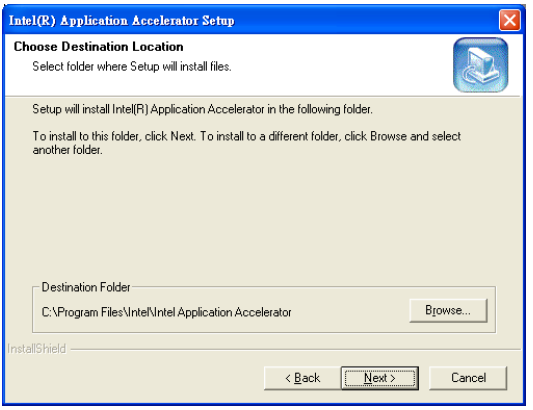
2. Click on "Next" when you see the following message.



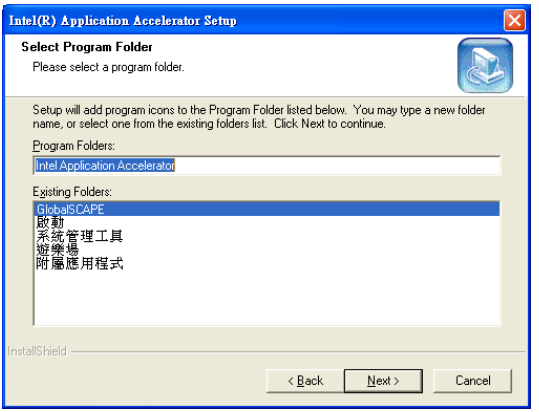
3. When you see the following message, click on "Yes" to accept the License Agreement.



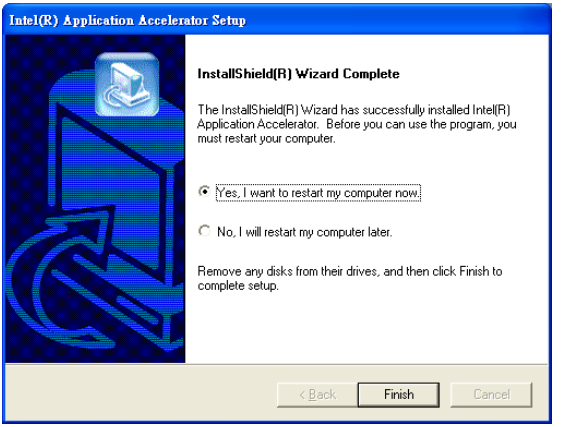
4. Click on "Next" when you see the following message.



5. Click on "Next" to continue.

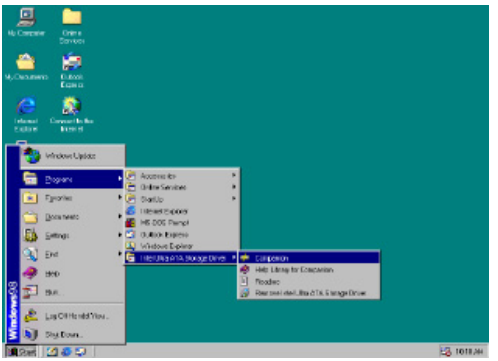


6. When the following message appears, click "Finish" to complete the installation and restart Windows.

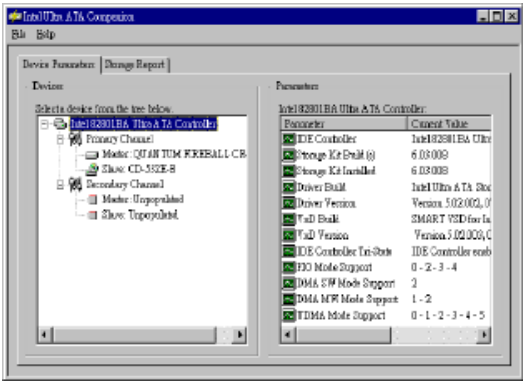


8.4 Displaying Driver Information

1. From the desktop of Windows, click on "Start" and select "Programs." Then select "Intel Ultra ATA Storage Driver" and then "Companion."



2. Click on the "Device Parameters" or the "Storage Report" tab to view related information.



CHAPTER 9

Onboard Security Setup

Chapter 9 Onboard Security Setup

9.1 Introduction

The AIMB-740-6CB1's hardware monitor is designed with Winbond W83627HF. Onboard security (OBS) functions monitor key hardware. They help you maintain your system's stability and durability. The AIMB-740-6CB1 can monitor 5 sets of system positive voltages, 2 sets of system negative voltages, CPU cooling fan speed, and CPU temperature. The positive system voltage sets which can be monitored include:

- CPU core voltage: 1.3 V ~ 3.3 V, according to Intel specifications
- Transmission voltage from CPU to chipset: typically 1.8 V
- Chipset voltage: typically 3.3.
- Main voltage: +5 V, +12 V

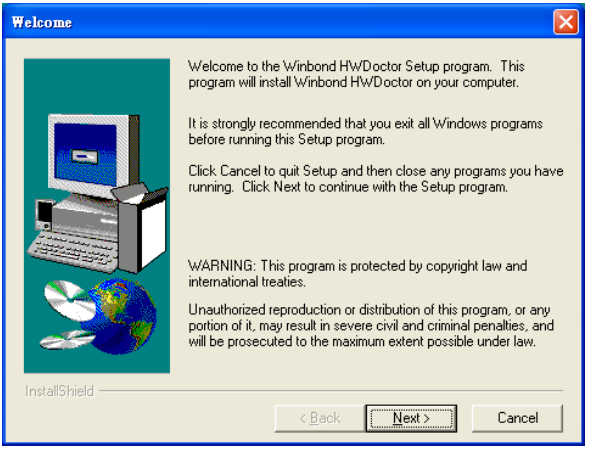
The negative system voltage sets which can be monitored include:

- Main voltage: -5 V, -12 V

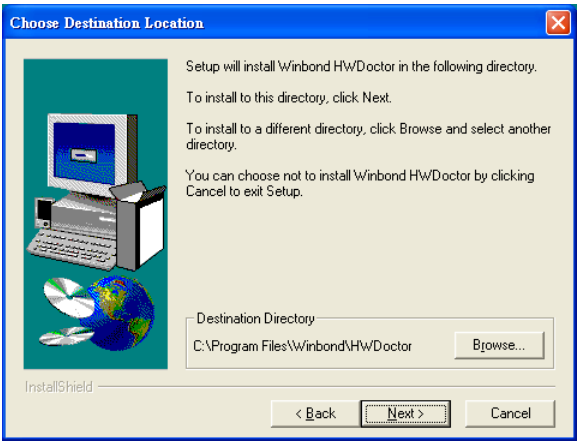
9.2 Windows XP Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears. Click on the "Install" button under the "OBS DRIVERS" heading.

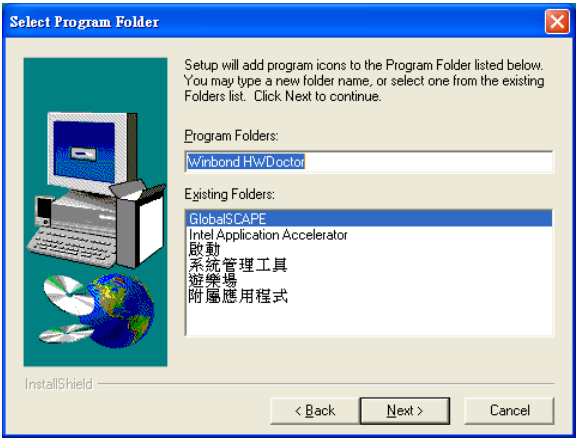
2. Click "Next" when you see the following message.



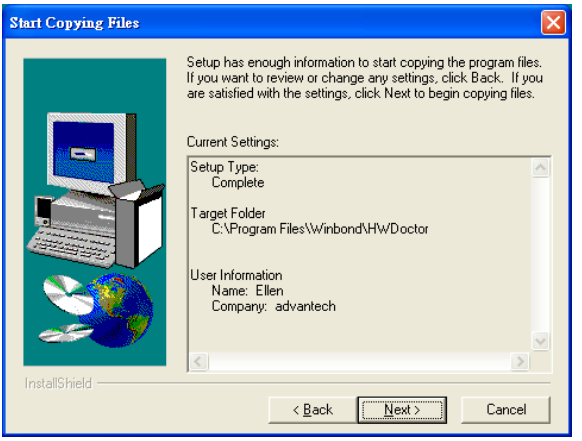
3. Click "Next" when you see the following message.



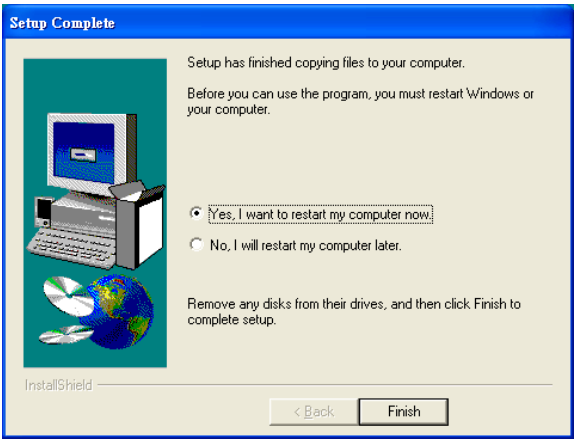
4. Click "Next" when you see the following message.



5. Click "Next" to continue.



6. Click "Finish" when you see the following message.



9.3 Using the OBS Hardware Doctor Utility

After completing the setup, all the OBS functions are permanently enabled. When a monitored reading exceeds safe limits, a warning message will be displayed and an error beep tone will activate to attract your attention.

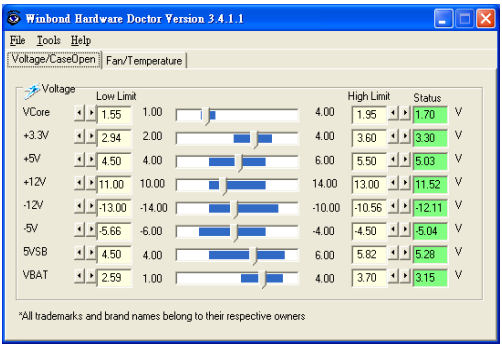
OBS Hardware Doctor will show an icon on the right side of the bottom window bar. This icon is the "Terminate and Stay Resident" (TSR) icon. It will permanently remain in the bottom window bar, and will activate warning signals when triggered by the onboard security

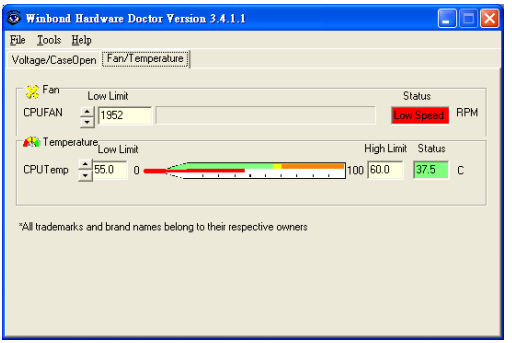
system.

You can view or change values for various OBS settings by running this utility:

1. From the desktop of Windows, click on "Start" and select "Programs", select "Winbond HWDoctor" and click "HWDOCTOR."

2. It is recommended that you load the default values for all the OBS settings. However, if desired, you can establish new conditions for voltage, fan speed, and temperature.




Winbond Hardware Doctor Version 3.4.1.1
File Tools Help
Voltage/CaseOpen Fan/Temperature
Fan
Low Limit
Status
CPUFAN
1952
Low Speed
RPM
Temperature
Low Limit
High Limit
Status
CPUTemp
55.0
0
100
60.0
37.5
C
*All trademarks and brand names belong to their respective owners

Appendix A

Programming the Watchdog Timer

Appendix A Programming the watchdog timer

A.1 Programming the Watchdog Timer

The AIMB-740-6CB1's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function after the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog timer overview

The watchdog timer is built-in the super I/O controller W83627HF. It provides the following functions for user programming:

- Can be enabled and disabled by user's program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates an interrupt or resets signal if the software fails to reset the timer after time-out

A.1.2 Reset/ Interrupt selection

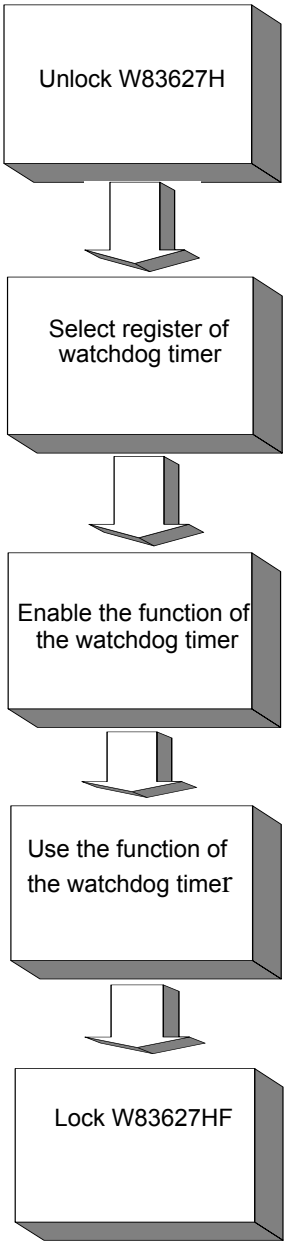
The J2 jumper is used to select reset or interrupt (IRQ 11) in the event the watchdog timer is tripped. See Chapter 1 for detailed jumper settings.

Note: The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.

A.1.3 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port.

You must first assign the address of register by writing address value into address port 2E(hex), then write/read data to/from the assigned register through data port 2F (hex).


Unlock W83627H
Select register of watchdog timer
Enable the function of the watchdog timer
Use the function of the watchdog timer
Lock W83627HF

Watchdog Timer Registers		
Address of register (2E)	**Attribute**	
Read/Write	Value (2F) and description	
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock theW83627HF
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer.
Write 0 to bit 3: set second as counting unit. [default]		
Write 1 to bit 3: set minute as counting unit		
F6 (hex)	write	0: stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.

F7 (hex)	read/write	Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is ""time out""."
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer.2

Table A.1: Watchdog timer registers

A.1.4 Example Program

1. Enable watchdog timer and set 10 sec. as timeout interval

```
;--------------------------------------------------------
Mov dx,2eh                ; Unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h                ; Select registers of watchdog timer
Out   dx,al
Inc   dx
Mov  al,08h
Out   dx,al
;--------------------------------------------------------
Dec dx                    ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc   dx
Mov  al,01h
Out   dx,al
```

```
;--------------------------------------------------------
Dec dx                  ; Set second as counting unit
Mov  al,0f5h
Out    dx,al
Inc    dx
In     al,dx
And al,not 08h
Out    dx,al
;--------------------------------------------------------
Dec dx                  ; Set timeout interval as 10 seconds and
Mov  al,0f6h              start counting
Out    dx,al
Inc    dx
Mov  al,10
Out    dx,al
;--------------------------------------------------------
Dec dx                  ; lock W83627HF
Mov  al,0aah
Out    dx,al
```

2. Enable watchdog timer and set 5 minutes as timeout interval

```
;--------------------------------------------------------
Mov dx,2eh              ; unlock W83627H
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h              ; Select registers of watchdog timer
Out    dx,al
Inc    dx
Mov  al,08h
Out    dx,al
```

```
;--------------------------------------------------------
Dec dx                  ; Enable the function of watchdog timer
Mov  al,30h
Out    dx,al
Inc    dx
Mov  al,01h
Out    dx,al
;--------------------------------------------------------
Dec dx                  ; Set minute as counting unit
Mov  al,0f5h
Out    dx,al
Inc    dx
In     al,dx
Or  al,08h
Out    dx,al
;--------------------------------------------------------
Dec dx                  ; Set timeout interval as 5 minutes and
Mov  al,0f6h              start counting
Out    dx,al
Inc    dx
Mov  al,5
Out    dx,al
;--------------------------------------------------------
Dec dx                  ; lock W83627HF
Mov  al,0aah
Out    dx,al
```

3. Enable watchdog timer to be reset by mouse

```
;--------------------------------------------------------
Mov dx,2eh              ; unlock W83627H
Mov al,87h
Out dx,al
```

```
Out dx,al
;--------------------------------------------------------
Mov al,07h              ; Select registers of watchdog timer
Out   dx,al
Inc    dx
Mov  al,08h
Out   dx,al
;--------------------------------------------------------
Dec dx                  ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc    dx
Mov  al,01h
Out   dx,al
;--------------------------------------------------------
Dec dx                  ; Enable watchdog timer to be reset by mouse
Mov  al,0f7h
Out   dx,al
Inc    dx
In     al,dx
Or   al,80h
Out   dx,al
;--------------------------------------------------------
Dec dx                  ; lock W83627HF
Mov  al,0aah
Out   dx,al
```

4. Enable watchdog timer to be reset by keyboard

```
;--------------------------------------------------------
Mov dx,2eh              ; unlock W83627H
Mov al,87h
Out dx,al
```

```
Out dx,al
;--------------------------------------------------------
Mov al,07h                ; Select registers of watchdog timer
Out   dx,al
Inc    dx
Mov  al,08h
Out   dx,al
;--------------------------------------------------------
Dec dx                    ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc    dx
Mov  al,01h
Out   dx,al
;--------------------------------------------------------
Dec dx                    ; Enable watchdog timer to be strobed
Mov  al,0f7h                reset by keyboard
Out   dx,al
Inc    dx
In     al,dx
Or   al,40h
Out   dx,al
;--------------------------------------------------------
Dec dx                    ; lock W83627HF
Mov  al,0aah
Out   dx,al
```

5. Generate a time-out signal without timer counting

```
;--------------------------------------------------------
Mov dx,2eh                ; unlock W83627H
Mov al,87h
Out dx,al
```

```
Out dx,al
;--------------------------------------------------------
Mov al,07h                ; Select registers of watchdog timer
Out   dx,al
Inc    dx
Mov  al,08h
Out   dx,al
;--------------------------------------------------------
Dec dx                    ; Enable the function of watchdog timer
Mov  al,30h
Out   dx,al
Inc    dx
Mov  al,01h
Out   dx,al
;--------------------------------------------------------
Dec dx                    ; Generate a time-out signal
Mov  al,0f7h
Out   dx,al               ;Write 1 to bit 5 of F7 register
Inc    dx
In      al,dx
Or   al,20h
Out   dx,al
;--------------------------------------------------------
Dec dx                    ; lock W83627HF
Mov  al,0aah
Out   dx,al
```

Appendix B

I/O Pin Assignments

Appendix B Pin Assignments

B.1 IDE Hard Drive connector (CN1, CN2)

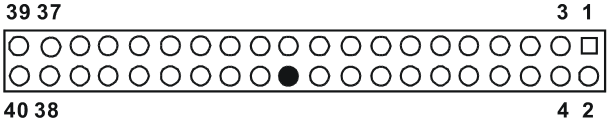


Table B.1: IDE hard drive connector (CN1, CN2)

Pin	Signal	Pin	Signal
1	IDE RESET*	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	DISK DMA REQUEST	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	CSEL
29	HDACKO*	30	GND
31	IRQ14	32	IDSC16-
33	ADDR 1	34	PDIAG
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0*	38	HARD DISK SELECT 1*
39	IDE ACTIVE*	40	GND

* low active

B.2 Floppy Drive connector (CN3)

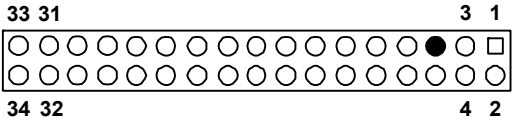


Table B.2: Floppy drive connector (CN3)			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	FDHDIN*
3	GND	4	N/C
5	N/C	6	FDEDIN*
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTOR 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE GATE*
25	GND	26	TRACK 0*
27	GND	28	WRITE PROTECT*
29	GND	30	READ DATA*
31	GND	32	HEAD SELECT*
33	GND	34	DISK CHANGE*
* low active			

B.3 Parallel Port connector (CN4)

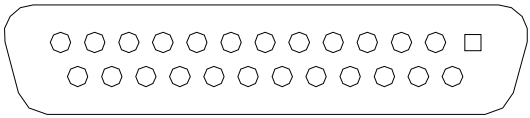


Table B.3: Parallel port connector (CN4)

Pin	Signal	Pin	Signal
1	STROBE*	14	AUTOFD*
2	D0	15	ERR
3	D1	16	INIT*
4	D2	17	SLCTINI*
5	D3	18	GND
6	D4	19	GND
7	D5	20	GND
8	D6	21	GND
9	D7	22	GND
10	ACK*	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	N/C

* low active

B.4 USB connector (CN6)

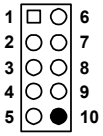


Table B.4: USB1/USB2 connector (CN6)			
Pin	**USB1 Signal**	**Pin**	**USB2 Signal**
1	+5 V	6	+5 V
2	UV-	7	UV-
3	UV+	8	UV+
4	GND	9	GND
5	Chassis GND	10	N/CA

B.5 VGA connector (CN7)

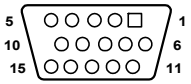


Table B.5: VGA connector (CN7)			
Pin	**Signal**	**Pin**	**Signal**
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK

B.6 COM1/COM2 RS-232 Serial Port (CN9, CN10)

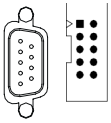


Table B.6: COM1/2 RS-232 serial port (CN9/10)

Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

B.7 Keyboard and Mouse connector (CN11)

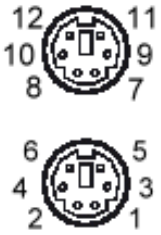


Table B.7: Keyboard and mouse connector (CN11)	
Pin	**Signal**
1	KB DATA
2	N/C
3	GND
4	KB VCC
5	KB CLK
6	N/C

B.8 External Keyboard connector (CN12)

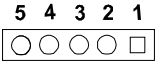


Table B.8: External keyboard connector (CN12)	
Pin	**Signal**
1	CLK
2	DATA
3	NC
4	GND
5	VCC

B.9 CPU/System Fan Power connector (CN14/15/37)

Table B.9: CPU/System Fan Power Conn (CN14/15/37)	
Pin	**Signal**
1	GND
2	+12V
3	Detect

B.10 Power LED (CN16)

You can use an LED to indicate when the motherboard is on. Pin 1 of CN16 supplies the LED's power, and Pin 3 is the ground.

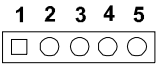


Table B.10: Power LED and keylock conn (CN16)	
Pin	**Function**
1	LED power (+5 V)
2	NC
3	GND
4	NC
5	GND

B.11 External Speaker connector (CN17)

The motherboard has its own buzzer. You can also connect it to the external speaker on your computer chassis.

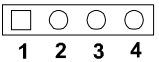


Table B.11: External Speaker Connector (CN17)

Pin	Function
1	Buzzer
2	NC
3	Buzzer
4	Speaker out

B.12 Reset connector (CN18)

Table B.12: Reset connector (CN18)

Pin	**Signal**
1	RESET
2	GND

B.13 HDD LED connector (CN19)

Table B.13: HDD LED connector (CN19)	
Pin	Signal
1	VCC (LED+)
2	IDE LED (LED-)

B.14 ATX Soft Power Switch (CN21))

Table B.14: ATX soft power switch (CN21)	
Pin	**Signal**
1	5VSB
2	PWR-BTN

B.15 H/W Monitor Alarm (CN22)

Table B.15: H/W monitor alarm (CN22)

Pin	Signal
1	Enable OBS alarm
2	Disable OBS alarm

B.16 SM Bus connector (CN29)

Table B.16: SM Bus connector (CN 29)

Pin	Signal
1	SMB_DATA
2	SMB_CLK

B.17 USB ports (CN31 and CN32

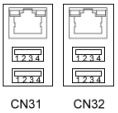


Table B.17: USB port			
Pin	**Signal**	**Pin**	**Signal**
1	VCC	3	Data0+
2	Data0-	4	GND

B.18 LAN ports (CN31 and CN32

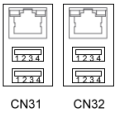
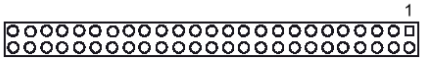


Table B.18: Ethernet 10/100Base-T RJ-45 port			
Pin	**Signal**	**Pin**	**Signal**
1	XMT+	5	N/C
2	XMT-	6	RCV-
3	RCV+	7	N/C
4	N/C	8	N/C

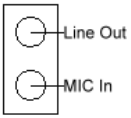
B.19 CF socket (CN44)



CN44

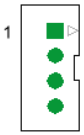
Table B.19: CF socket (CN44)			
Pin	**Signal**	**Pin**	**Signal**
1	GND	26	#CD1
2	D03	27	D11
3	D04	28	D12
4	D05	29	D13
5	D06	30	D14
6	D07	31	D15
7	#CS1	32	#CS1
8	A10	33	#VS1
9	ATA SEL	34	#IORD
10	A09	35	#IOWR
11	A08	36	#WE
12	A07	37	INTRQ
13	VCC	38	VCC
14	A06	39	#CSEL
15	A05	40	#VS2
16	A04	41	#RESET
17	A03	42	IORDY
18	A02	43	#INPACK
19	A01	44	#REG
20	A00	45	#DASP
21	D00	46	#PDIAG
22	D01	47	D08
23	D02	48	D09
24	#IOIS16	49	D10
25	#CD2	50	GND

B.20 Line Out, Mic IN connector (CN55)



CN55

B.21 Audio input from CD-ROM (CD IN; CN56)



CN56

Table B.20: Audio in from CD-ROM (CD IN; CN56)

Pin	Signal	Pin	Signal
1	CD_L	3	GND
2	GND	4	CD_R

B.22 Aux Line-In connector (AUX IN; CN57)

Table B.21: Aux Line-In connector (AUX IN; CN57)

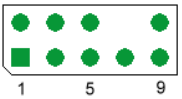
Pin	Signal	Pin	Signal
1	AUX_L	3	GND
2	GND	4	AUX_R

B.23 Modem-In connector (MDM IN; CN58)

Table B.22: Modem-In connector (MDM IN; CN58)

Pin	Signal	Pin	Signal
1	PHONE_IN	3	GND
2	GND	4	MONOOUT

B.24 Front Panel audio connector (FP AUDIO; CN59)

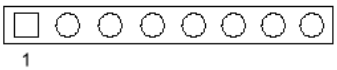


CN59

Table B.23: Front audio conn (FP AUDIO; CN59)

Pin	Signal	Pin	Signal
1	MIC	6	LOUT_RR
2	GND	7	NC
3	MIC_BIAS	8	NC
4	VCC	9	LOUT_L
5	LOUT_R	10	LOUT_LL

B.25 8-pin Alarm Board connector (CN62)



CN62

Table B.24: 8-pin Alarm Board Connector (CN62)

Pin	Signal	Pin	Signal
1	5VSB	5	VCC
2	GND	6	VCC3
3	GND	7	-12V
4	-5V	8	+12V

B.26 Case Open connector (CN64; only AIMB-740-6CB1)

Table B.25: Case Open connector (CN64; only AIMB-740-6CB1)

Pin	Signal
1	CASEOP
2	GND

B.27 Front Panel LAN LED connector (CN65; only AIMB-740-6CB1)

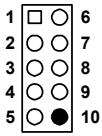


Table B.26: Front Panel LAN LED connector (CN65; only AIMB-740-6CB1)

Pin	USB1 Signal	Pin	USB2 Signal
1	LAN1_LINK	2	LAN2_LINK
3	LAN1_ACT	4	LAN2_LINK
5	LAN1_LINK1000	6	LAN2_LINK1000
7	LAN1_LINK100	8	LAN2_LINK100
9	3VDUAL	10	N/C

B.28 System I/O Ports

Table B.27: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Game I/O
278-27F	Parallel printer port 2 (LPT3)
290-297	On-board hardware monitor
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

B.29 DMA Channel Assignments

Table B.28: DMA channel assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

B.30 Interrupt Assignments

Table B.29: Interrupt assignments

Priority	Interrupt#	Interrupt source
1	NMI	Parity error detected
2	IRQ0	Interval timer
3	IRQ1	Keyboard
-	IRQ2	Interrupt from controller 2 (cascade)
4	IRQ8	Real-time clock
5	IRQ9	Cascaded to INT 0A (IRQ 2)
6	IRQ10	COM3~COM6
7	IRQ11	COM3~COM6
8	IRQ12	PS/2 mouse
9	IRQ13	INT from co-processor
10	IRQ14	Primary IDE Channel
11	IRQ15	Secondary IDE Channel
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	Parallel port 2
15	IRQ6	Diskette controller (FDC)
16	IRQ7	Parallel port 1 (print port)

B.31 1st MB Memory Map

Table B.30: 1st MB memory map	
Addr. range (Hex)	**Device**
E0000h - FFFFFh	BIOS
CC000h - DFFFFh	Unused
C0000h - CBFFFh	VGA BIOS
A0000h - BFFFFh	Video Memory
00000h - 9FFFFh	Base memory

B.32 PCI Bus Map

Table B.31: PCI bus map (for V/VE/E2 version; V upon request)				
Function Signals:	**Device ID**	**INT# pin**	**GNT**	**REQ**
Onboard LAN1	AD24	INT E		
Onboard LAN2	AD20	INT H	GNT E	REQ E
Bridge	AD22		GNT F	REQ F
PCI slot 1	AD31	INT B, C, D, A	GNT A	REQ A
PCI slot 2	AD30	INT C, D, A, B	GNT B	REQ B
PCI slot 3	AD29	INT D, A, B, C	GNT 1	REQ 1
PCI slot 4	AD28	INT A, B, C, D	GNT 2	REQ 2
PCI slot 5	AD27	INT B, C, D, A	GNT 3	REQ 3

Table B.32: PCI bus map (for VG/G2 version; G2 upon request)				
Function Signals:	**Device ID**	**INT# pin**	**GNT**	**REQ**
Onboard LAN1	AD21	INT G	GNT D	REQ D
Onboard LAN2	AD20	INT H	GNT E	REQ E
Bridge	AD22		GNT F	REQ F
PCI slot 1	AD31	INT B, C, D, A	GNT A	REQ A
PCI slot 2	AD30	INT C, D, A, B	GNT B	REQ B
PCI slot 3	AD29	INT D, A, B, C	GNT 1	REQ 1
PCI slot 4	AD28	INT A, B, C, D	GNT 2	REQ 2
PCI slot 5	AD27	INT B, C, D, A	GNT 3	REQ 3

Appendix C

GPIO Programming Source Code

Appendix C GPIO Programming Source Code

```
        .MODEL small,c
        .486p
        .DOSSEG
        .STACK
        .CONST
SMBus_PortEQU5000h
GPIO_AddressEQU9Ch

Control_RegEQU0
Output_RegEQU1
Input_RegEQU2
SEQ_LEN      EQU    8

          .DATA
COUNT        DW     ?
START_AXISDB?
GPO_AXISDB?
GPI_AXISDB ?
TEST1_GPODW?
TEST1_GPIDW?
GPI_STR      DB     'GPI $'
GPO_STR      DB     'GPO $'
STS_STR      DB     'STS $'
FAIL_STRDB 'Test Failed .. $'
PASS_STRDB 'Test Pass .... $'
CR_LF        DB     0Ah, 0Dh, '$'

SEQ_1        DB     0, 1, 2, 3,  8,  9, 10, 11
SEQ_2        DB     4, 5, 6, 7, 12, 13, 14, 15

;[]=========================================================[]
; CN93  GPIO0  GPIO1  GPIO2  GPIO3  GPIO4  GPIO5  GPIO6  GPIO7
; F75111 GPIO16 GPIO17 GPIO20 GPIO21 GPIO22 GPIO14 GPIO11 GPIO12
;
; CN94  GPIO8  GPIO9  GPIO10 GPIO11 GPIO12 GPIO13 GPIO14 GPIO15
; F75111 GPIO31 GPIO32 GPIO33 GPIO23 GPIO24 GPIO25 GPIO26 GPIO27
```

```
;[]============================================================[]
GPIO_TableDB16h, 17h, 20h, 21h, 22h, 14h, 11h, 12h
                DB      31h, 32h, 33h, 23h, 24h, 25h, 26h, 27h

;[]============================================================[]
; GPIO_1X at 10h, GPIO_2X at 20h, GPIO_3X at 40h

;[]============================================================[]
REG_TableDB 10h, 20h, 40h
    .CODE

;[]============================================================[]
; MACRO

;[]============================================================[]
PRINT   MACRO   String
    push    ax
    push    dx
ifnb    <String>
    lea     dx, String
endif
    mov     ah,09h
    int     21h
    pop     dx
    pop     ax
    ENDM

P_CHAR  MACRO   One_Char
    push    ax
ifnb    <One_Char>
      mov     al,One_Char
endif
      mov     ah,0eh
    int     10h
    pop     ax
    ENDM

GetKeyMACRO
      xor     ah, ah
      int     16h
```

```
        ENDM

P_HEXMACROHEX_Num
        pusha
        xor     ah, ah
ifnb    <HEX_Num>
        mov     al, HEX_Num
endif
        mov     bl, 10
        div     bl

        mov     dx, ax
        shl     eax, 16
        mov     ax, dx

        mov     ah, 0Eh
        add     al, '0'
        int     10h

        shr     eax, 24
        mov     ah, 0Eh
        add     al, '0'
        int     10h

        popa
        ENDM

CLS     MACRO
        pusha
        mov     ah, 7
        mov     al, 0
        mov     cx, 0
        mov     dx, 184fh
        mov     bh, 7
        int     10h
        popa
        ENDM

SET_CURSORMACROrow, col
        push    dx
```

```
        push    bx
        push    ax
        mov     dh, row
        mov     dl, col
        mov     bx, 0
        mov     ah, 2
        int     10h
        pop     ax
        pop     bx
        pop     dx
        ENDM

DELAY_MMACRO
        push    cx
        mov     cx, 1000
@@:
        NEWIODELAY
        loop    short @B
        pop     cx

        ENDM

NEWIODELAYMACRO
        out     0EBh, al
        ENDM

    .STARTUP
                mov     ax, @DATA
                mov     ds, ax
                xor     ax, ax

                ;make the cursor disapper
                mov     ah, 01
                mov     ch, 20h
                int     10h

                mov     START_AXIS, 0
                CLS

                lea     ax, SEQ_1
```

```
                lea     bx, SEQ_2
                call    Do_Test1

                mov     START_AXIS, 7

                lea     ax, SEQ_2
                lea     bx, SEQ_1
                call    Do_Test1

                ;make the cursor default
                mov     ah, 01
                mov     ch, 0bh
                mov     cl, 0ch
                int     10h

                mov     ah, 4Ch
                int     21h

                .EXIT

;[]=============================================================[]
;Input  : AX - GPO sequence
;         BX - GPI sequence

;[]=============================================================[]
Do_Test1Proc  Near
                pusha

                mov     TEST1_GPO, ax
                mov     TEST1_GPI, bx

                mov     al, START_AXIS
                mov     GPO_AXIS, al
                add     GPO_AXIS, 1
                mov     al, START_AXIS
                mov     GPI_AXIS, al
                add     GPI_AXIS, 3


                SET_CURSOR START_AXIS, 0
```

```
                PRINT  GPO_STR

                ; print gpo info.
                mov     bx, TEST1_GPO
                mov     cx, SEQ_LEN
gpo_num:
                mov     ax, cx
                sub     ax, SEQ_LEN
                neg     ax
                xlat
                P_HEX al
                P_CHAR20h
                loop    gpo_num

                inc     START_AXIS
                SET_CURSOR START_AXIS, 0
                PRINT  STS_STR
                inc     START_AXIS
                SET_CURSOR START_AXIS, 0
                PRINT  GPI_STR

                ; print gpi info.
                mov     bx, TEST1_GPI
                mov     cx, SEQ_LEN
gpi_num:
                mov     ax, cx
                sub     ax, SEQ_LEN
                neg     ax
                xlat
                P_HEX al
                P_CHAR20h
                loop    gpi_num

                inc     START_AXIS
                SET_CURSOR START_AXIS, 0
                PRINT  STS_STR

                ; start test procedure
                mov     cx, SEQ_LEN
run_test1:
```

```
                mov     dx, cx
                sub     dx, SEQ_LEN
                neg     dx
                mov     bx, TEST1_GPO
                SET_CURSOR GPO_AXIS, 4
                call    Belt_GPO_SEQ
                SET_CURSOR GPI_AXIS, 4
                mov     bx, TEST1_GPI
                call    Dsp_GPI_SEQ

.IF             COUNT != (SEQ_LEN - 1)
                jmp     fail_test
.ENDIF
                DELAY_M

                loop    run_test1
                jmp     short ok_test
fail_test:
                inc     START_AXIS
                SET_CURSOR START_AXIS, 0
                PRINT  FAIL_STR
                P_CHAR07h
                DELAY_M
                P_CHAR07h
                DELAY_M
                jmp     end_test
ok_test:
                inc     START_AXIS
                SET_CURSOR START_AXIS, 0
                PRINT  PASS_STR
end_test:
                P_CHAR07h
                popa
                ret
Do_Test1EndP

;[]=======================================================[]
;Input  : BX - GPO sequence Table offset
;         DX - set number of pin
```

```
;[]=======================================================[]
Belt_GPO_SEQProcNear
                pusha

                mov     cx, SEQ_LEN
reset_seq:
                mov     ax, cx
                sub     ax, SEQ_LEN
                neg     ax
                xlat
                xor     ah, ah
                call    Set_GPO_Level
                loop    reset_seq

                mov     cx, SEQ_LEN
gpo_sts:
                mov     ax, cx
                sub     ax, SEQ_LEN
                neg     ax
                cmp     ax, dx
                je      p_1
                P_HEX 0
                jmp     p_0
p_1:
                P_HEX 1
p_0:
                P_CHAR20h
                loop    gpo_sts

                mov     ax, dx
                xlat
                mov     ah, 1
                call    Set_GPO_Level

                popa
                ret
Belt_GPO_SEQEndP
```

```
;[]=============================================================[]
;Input  : BX - GPI sequence Table offset
;Output : COUNT - number of GPI Low

;[]=============================================================[]
Dsp_GPI_SEQProcNear
                pusha
                mov     COUNT, 0

                mov     cx, SEQ_LEN
gpi_sts:
                mov     ax, cx
                sub     ax, SEQ_LEN
                neg     ax
                xlat
                call    Get_GPI_Status

                P_HEX al
                P_CHAR20h

.IF             al == 0
                inc COUNT
.ENDIF

                loop    gpi_sts

                popa
                ret
Dsp_GPI_SEQEndP

;[]=============================================================[]
;Input  : AL - GPIO number
;       For example, AL is 20 if use GPIO 20
;Output : AL - 1 = High
;             0 = Low

;[]=============================================================[]
Get_GPI_StatusProcNear
                push    dx
                push    bx
```

```
                push    cx

                call    Get_GPIO_Info

                mov     cl, bl
                add     cl, Control_Reg
                call    I2CReadByte

                push    bx
                mov     cl, bl
                add     cl, Control_Reg
                not     bh
                and     al, bh
                call    I2CWriteByte
                pop     bx

                mov     cl, bl
                add     cl, Input_Reg
                call    I2CReadByte
                test    al, bh
                jnz     GPI_High
                xor     al, al
                jmp     Get_End
GPI_High:
                mov     al, 1
Get_End:
                pop     cx
                pop     bx
                pop     dx

                ret
Get_GPI_StatusEndp

;[]============================================================[]
;Input  : AL - GPIO number
;       For example, AL is 20 if use GPIO 20
;          AH - 1 = High
;               0 = Low
```

```
;[]=======================================================[]
Set_GPO_LevelProcNear

                pusha
                call    Get_GPIO_Info

                ; set output function
                mov     cl, bl
                add     cl, Control_Reg
                call    I2CReadByte

                mov     cl, bl
                add     cl, Control_Reg
                or      al, bh
                call    I2CWriteByte

                ; output data
                mov     cl, bl
                add     cl, Output_Reg
                call    I2CReadByte

                or      ah, ah
                jnz     Set_High
                not     bh
                and     al, bh
                jmp     Write_Byte
Set_High:
                or      al, bh
Write_Byte:
                mov     cl, bl
                add     cl, Output_Reg
                call    I2CWriteByte

                popa
                ret
Set_GPO_LevelEndp

;[]=======================================================[]
;Input  : AL - GPIO number
;       For example, AL is 20 if use GPIO 20
```

```
;Output : BH - GPIO bit mask
;        BL - GPIO register index

;[]=======================================================[]
Get_GPIO_InfoProcNear

        push    ax              ;push ax to store ah
        push    cx
        push    dx

        push    ax
        mov     ax, @DATA
        mov     ds, ax
        pop     ax


        lea     bx, GPIO_Table
        xlat

        mov     cl, al
        and     cl, 0F0h
        mov     bl, cl

        ; patch for F75111
        cmp     bl, 30h
        jne     Not_GPIO_3X
        mov     bl, 40h         ; GPIO3X at 40h
Not_GPIO_3X:

        mov     cl, al
        and     cl, 0Fh
        mov     ax, 1
        shl     al, cl
        mov     bh, al

        pop     dx
        pop     cx
        pop     ax

        ret
```

```
Get_GPIO_InfoEndp

;[]=======================================================[]
;Input  : CL - register index
;Output : AL - value read

;[]=======================================================[]
I2CReadByte ProcNear
                push    bx
                push    cx
                push    dx

                mov     dx, SMBus_Port + 04h
                mov     al, GPIO_Address + 1
                out     dx, al
                NEWIODELAY
                NEWIODELAY

                call    Chk_SMBus_Ready

                mov     al, cl
                mov     dx, SMBus_Port + 03h
                out     dx, al                  ;index
                NEWIODELAY
                NEWIODELAY


                mov     dx, SMBus_Port + 02h
                mov     al, 48h
                out     dx, al                  ;read data
                NEWIODELAY
                NEWIODELAY

                mov     cx, 100h
        @@:
                NEWIODELAY
                loop    short @B

                call    Chk_SMBus_Ready
```

```
                mov     dx, SMBus_Port + 05h
                in      al, dx
                NEWIODELAY
                NEWIODELAY

                pop     dx
                pop     cx
                pop     bx

                ret
I2CReadByte Endp

;[]=============================================================[]
;Input  : CL - register index
;        AL - value to write

;[]=============================================================[]
I2CWriteByte ProcNear

                pusha
                push    ax

                mov     dx, SMBus_Port + 04h
                mov     al, GPIO_Address
                out     dx, al
                NEWIODELAY
                NEWIODELAY

                call    Chk_SMBus_Ready

                mov     al, cl
                mov     dx, SMBus_Port + 03h
                out     dx, al
                NEWIODELAY
                NEWIODELAY

                pop     ax
                mov     dx, SMBus_Port + 05h
                out     dx, al
                NEWIODELAY
```

```
                NEWIODELAY

                mov     dx, SMBus_Port + 02h
                mov     al, 48h
                out     dx, al
                NEWIODELAY
                NEWIODELAY

                mov     cx, 100h
        @@:
                NEWIODELAY
                loop    short @B

                call    Chk_SMBus_Ready

                popa

                ret
I2CWriteByte Endp


Chk_SMBus_ReadyProcNear

                pusha

                mov     dx, SMBus_Port + 0 ; status port
Chk_I2C_OK:
                in      al, dx          ; get status
                NEWIODELAY
                out     dx, al          ; clear status
                NEWIODELAY

                test    al, 02h         ; termination of command
                jnz     short Clear_final

                and     al, NOT 40h   ; mask INUSEbit
                or      al, al          ; status OK ?
                jz      short Clear_final

                test    al, 04h         ; device error
```

```
                jnz     short SMBus_Err

                jmp     short Chk_I2C_OK

                ;SMBus error due to timeout
SMBus_Err:
Clear_final:
                popa
                ret
Chk_SMBus_ReadyEndp

END
```